Contents p. 2

THE IRON AGE

THE NATIONAL METALWORKING WEEKLY February 2, 1950

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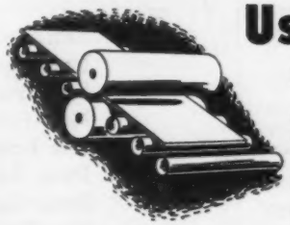
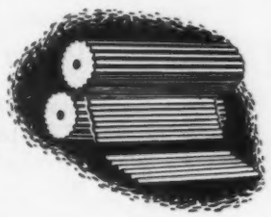
The atmospheric corrosion-resistance of Mayari R is 5 to 6 times that of plain carbon steel and 2 to 4 times that of copper-bearing steel.



Used as-rolled

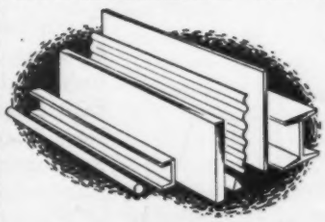
It has advantages of alloy steel without the expense of heat-treatment. Mayari R can be worked hot or cold in the as-rolled condition.



Workability

Mayari R can be formed, sheared, punched, drilled, and welded by the methods used for carbon steel.

Available in many forms



Mayari R is produced in sheets, strip, plates, bars, structural shapes, and cold-formed shapes.

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THE IRON AGE

CONTENTS

Editorial

A Good Job 7

News Interpretations

Newsfront 11
The Iron Age Summary 15
Global Letter 28
Machine Tool Highspots 32
On the Assembly Line 40
West Coast Progress Report 44
The Federal View 48

Special Features

Fatigue Cracks 20
Iron Age Introduces 22
Free Publications 34
New Production Ideas 35
The Economic Side, J. S. Lawrence 116
Dear Editor 144
Dear Customer 167
The Clearing House 180

Technical Articles

Drilling for Oil With Large Precision Castings 75
E Steel 79
Steel Shot Speeds Blast Cleaning, Shot Peening 82
MX Steel 86
Physical Properties of Ductile Zirconium 88
Radioactive Tracers Used to Study Plating Process 89
Northrop Develops New Aluminum Primer 90
Standard Space Heater Improves Drying Tower 93

Spot News of Industry

Committee Studies Steel Price Data 107
Dates to Remember 110
Industrial Shorts 111
ECA Finances Mining of Jamaica Bauxite 112
New Prices Squeezing Nonintegrated Mills 113
Bethlehem Adding Sheet Capacity in East 117

Markets & Prices

Market Briefs and Bulletins 119
Nonferrous Metals Outlook 120
Nonferrous Prices 121
Iron and Steel Scrap Market 122
Iron and Steel Scrap Prices 124
Comparison of Prices 126
Steel Prices 128
Miscellaneous Steel Prices 129
Stainless Steel, Pipe and Tubing Prices 131
Warehouse Steel and Pig Iron Prices 132
Ferroalloy Prices 133

Index to Advertisers 196

FEBRUARY 2, 1950 • • • VOL. 165, No. 5

Special Article

How two of the largest and most difficult precision castings ever attempted by Allis-Chalmers were successfully produced in its casting shop is explained in "Drilling for Oil With Large Precision Castings." These castings, parts of a new type oilwell drill, illustrate the application of precision casting techniques to large parts designed for severe service.—p. 75.

Issue Highlights

A 200 pct increase in tool life and up to 25 pct faster machinability over conventional bessemer free-machining steels are reported by users of J&L E steels. Contrary to usual recognized practice, greater machinability is achieved by lowering the carbon content of these steels to a maximum of 0.06 pct.—p. 79.

Sizable production economies may be realized in blast cleaning and shot peening operations through use of cast steel shot. Facts on shot consumption, equipment wear, and part finish have been determined through laboratory and field tests.—p. 82.

Hearings on the December steel price increases held last week in Washington did not produce the effect many politicians expected. Instead of defending the increases the steel officials explained them. Some went further—they argued that prices had not been raised enough.—p. 107.

Bethlehem Steel will add 900,000 tons to its flat-rolled steel capacity at Sparrows Point with a $30 million expansion program slated for completion in 15 months. The project, which includes more electrolytic tinplate capacity, will step up the plant's flat-rolled capacity by 40 pct.—p. 117.

With $11 million in ECA funds, a new subsidiary of Reynolds Metals Co. will start development of Jamaica bauxite deposits. Tapping an estimated reserve of 300 million tons of high-grade ore, the new project will provide a protected supply route for this strategic raw material.—p. 112.

Coming Next Week

That localized heating for machining has no detrimental effects on the hardness, surface condition, and microstructure of finished parts is proved through results of microhardness surveys, microstructure examinations, surface analyses, and Flaxfilm replicas. These studies, made on bars machined at room and elevated temperatures, are described in detail in an article appearing next week.

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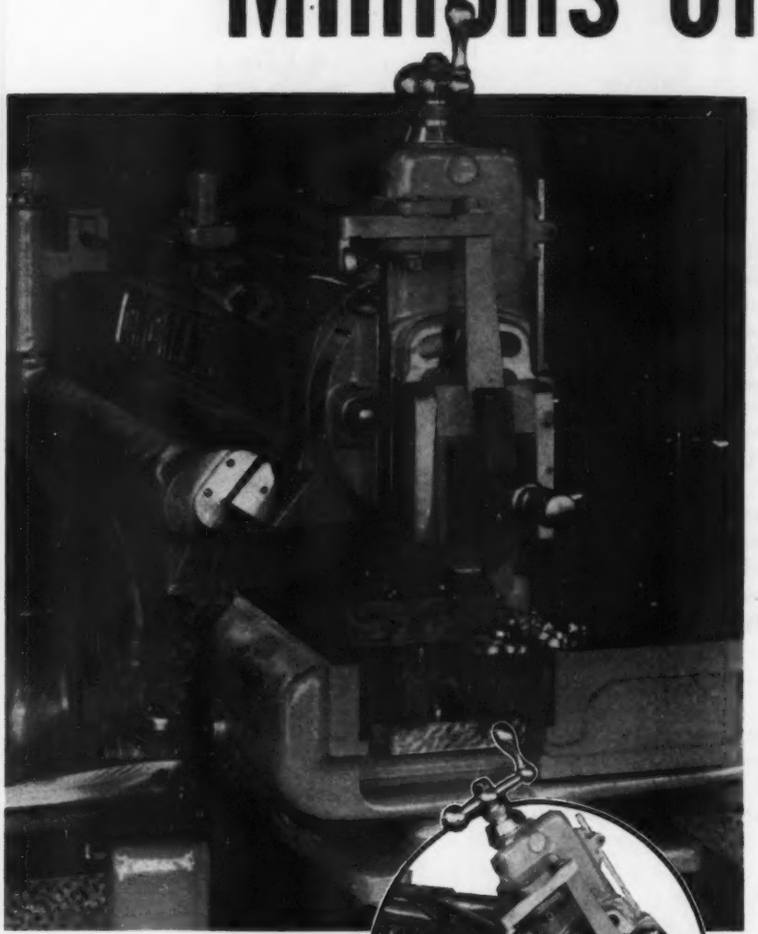

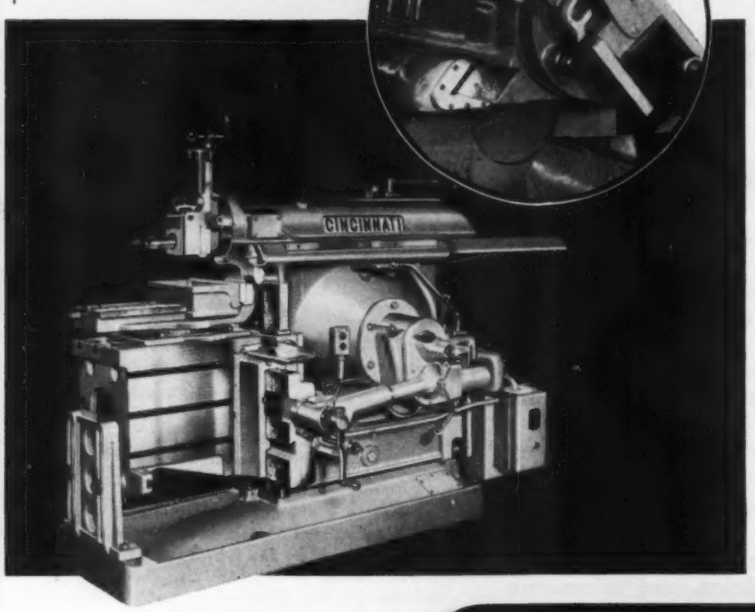

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Editorial

INDUSTRY VIEWPOINTS

A Good Job

WE have just had a steel hearing that was a little different than a few that went before. This time the industry people got a real chance to get their ideas over to the committee and the public.

There was nothing for steel people to apologize for at the "investigation." In fact there were many who still thought that steel prices were not yet high enough to give a proper return to companies.

The real significance in last week's steel hearings at Washington was that industry people had a clear-cut idea of what they wanted to say. And they said it. It still was a trifle queer to think though that steel firms should have to come to Washington and explain in detail why they should be allowed to make a profit.

It seems to be clear that some people in this country have felt that it is not quite cricket for companies to make a profit that will pay higher wages, pensions, replacements and dividends. Maybe this will change a little now.

One statement that was not read at last week's hearings but later became part of the record deserves a lot of attention. It was basic and we will hear more of it. It was too bad that it did not get a wide hearing. We repeat one of the more important parts of this basic presentation made by David Austin, vice-president sales, U. S. Steel Corp. of Delaware.

Said Mr. Austin "The commercial policy of United States Steel is to sell steel products of our manufacture at the lowest competitive price consistent with cost and a reasonable profit. We are constantly guided by the philosophy that the lower the price of the steel the more the needs and desires of the consuming public will be satisfied and the demand for steel stimulated. This is the essential commercial policy of any business enterprise if it is to grow, prosper, and fulfill its obligations to those who work for it, those who buy from it, those who own it, and to the public."

We think that this commercial policy is clear-cut, simple and outstanding. It denies the mistaken idea that steel firms are out to get all the traffic will bear on steel prices. And it shows what we have always felt. Steel people are firm believers in prices that are as low as possible consistent with a reasonable profit. If nothing else was made more plain last week than that we feel that the hearings were a good thing.

Tom C. Campbell

Editor

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UNDER today's conditions of high costs, management's Number One question is, "What can we do to lower our Break-Even Point?"

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NEWSFRONT

NEWS, METHODS AND PRODUCT FORECAST

► In spite of some widespread ideas to the contrary, Hot Spot Machining—even at 1450°F—has no bad effects on the finished part. Surface conditions resulting from high temperature machining apparently are better than those secured in room temperature machining.

► The two magnesium alloys that are normally used for sand castings, AZ92 and AZ63, may be successfully used for making lost-wax process castings. Care must be taken to assure an adequate cooling rate for the casting or mechanical properties will suffer.

► British firms have secured an order for 100,000 tons of steel rails for Communist China. The order was originally placed with Vereinigte Stahlwerke in Western Germany through a U. S. firm. But it was vetoed by the Allied Joint Export-Import Agency.

► A unique milling machine setup has been developed to make thread rolling dies for wood screws. Machining cost is surprising for work of this accuracy.

► A method is being developed to utilize creep phenomena to "freeze" an elastic pattern in photoelastic materials such as Catalin. This technique is being studied as a means of providing a much faster and easier method for three dimensional stress analysis.

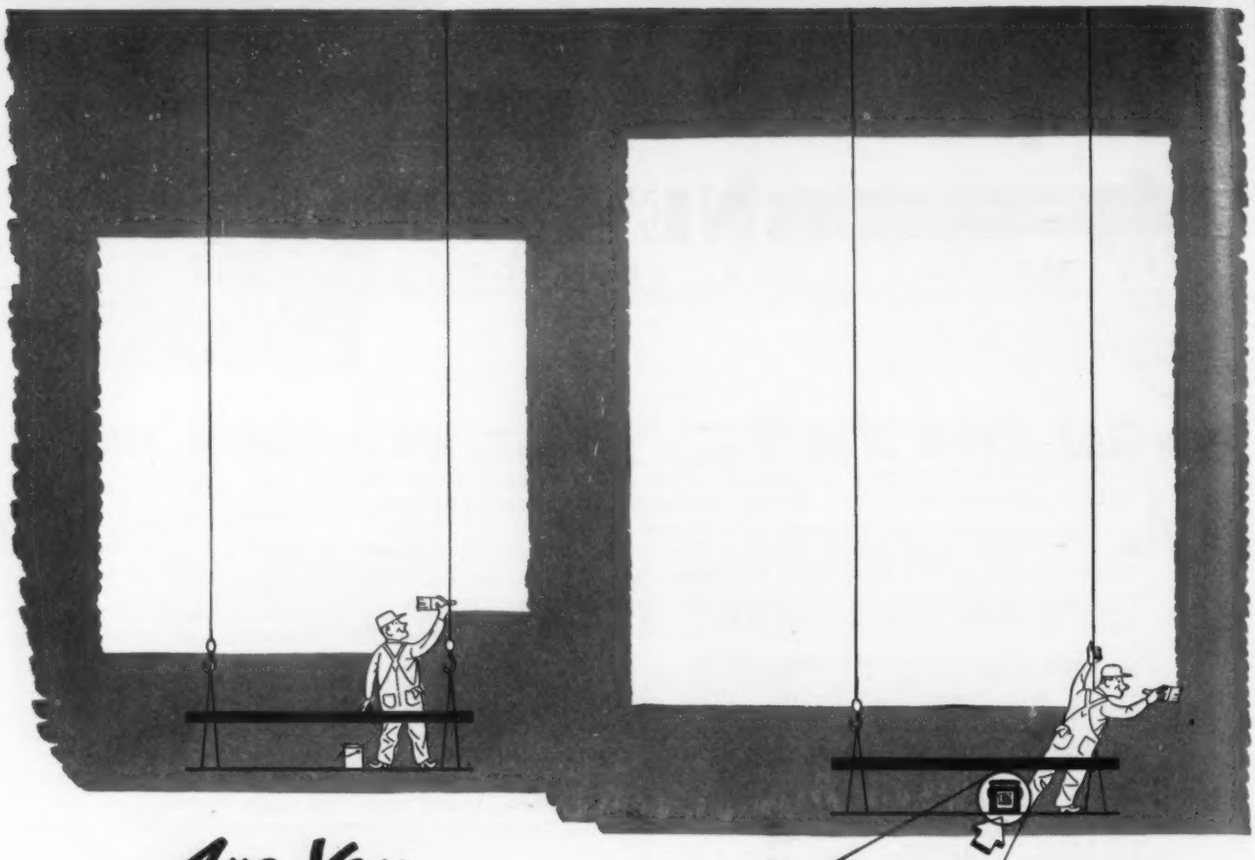
► The small nonintegrated mills that buy hot-rolled strip and convert it into cold rolled strip are finding it increasingly difficult to operate profitably. Their plight was made worse by the new price relationship between hot and cold-rolled strip resulting from price revisions made last December. They are now exploring the cost-saving possibilities of buying wider material, which is cheaper, and slitting it to the desired width, but tolerance problems are involved.

► By next summer Quebec Iron & Titanium Corp. will have mined some 50,000 to 75,000 tons of ilmenite ore in the Allard Lake region and will start up a furnace at Sorel, Que. The 27-mile railroad is almost completed. When full operations get underway, the five furnaces will produce 250,000 tons of titanium oxide slag and 175,000 tons of pig iron per year.

► Although current demand for aluminum foil is well within the capacity of the industry, there are several new applications being promoted by producers—any one of which might strain the capacity of the industry once it takes hold. There are now seven main producers in the field. Several of the applications call for heavy gage foil, which could boost the market for primary aluminum.

► To construct a new steel plant in Europe with a capacity of one million tons a year would involve an investment of between $200 and $300 million, according to a study prepared by the Secretariat of the Steel Div. of the United Nations Economic Commission for Europe.

► Recent tests show that anodic films prepared in sulfuric acid will fracture visibly at a unit strain of about the same order of magnitude as the elastic limit when applied to 53-ST alloy sheet whereas for chromic acid films the unit strain of fracture is four or five times the elastic limit of the base metal.



Are You Giving Your Painting Costs a "Square Deal"?

Keeping your plant well painted is important. It also costs important money. Naturally, you want the best possible job at lowest possible cost.

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Coal Cuts Ingot Rate to 93 Pct

Steel Users Pushing Production

Starting Eastern Mill in 1951

The Iron Age SUMMARY

IRON AND STEEL INDUSTRY TRENDS

THE coal shortage is not likely to force the steel industry to its knees in the near future though several companies are cutting back operations this week because of it. There will be hardships—some steel and a lot of money will be lost—but most big steel companies have better than average coal reserves.

A continued mine stoppage will produce a national emergency—one that anyone can recognize—before it slashes steel operations like they were cut in previous major coal strikes. This does not mean that some steel companies will not be hard hit if the strike continues—and the list will include some big ones.

Coal Shortage Hurts Output

But most top producers—the ones whose captive mines once set the industry pattern—are not strapped for coal now. A few have been quietly lending coal to utilities and maintaining high operation rates to boot. In some cases, however, rates are not as high as they could be with present steel demand.

Coal took another point off the ingot rate this week, dropping it to 93 pct of rated capacity. The 2 point decline during the past 2 weeks, mainly due to shortage of coal, has cost about 60,000 tons of steel ingot production. Steelmaking scrap prices are generally listless, though Pittsburgh showed a little strength. New sales there raised heavy melting steel by $1.00 a ton, advancing THE IRON AGE composite scrap price 33 cents to $27.08 per gross ton.

How much of the increasing pressure for steel delivery can be laid to buyer fears of shortages is not known in the industry. Buyers know that several steel companies had to cut back operations this week and that others have already slowed down. They realize that the situation will get progressively worse if the stoppage lasts so they are not taking chances.

Flat-Rolled Deliveries Lagging

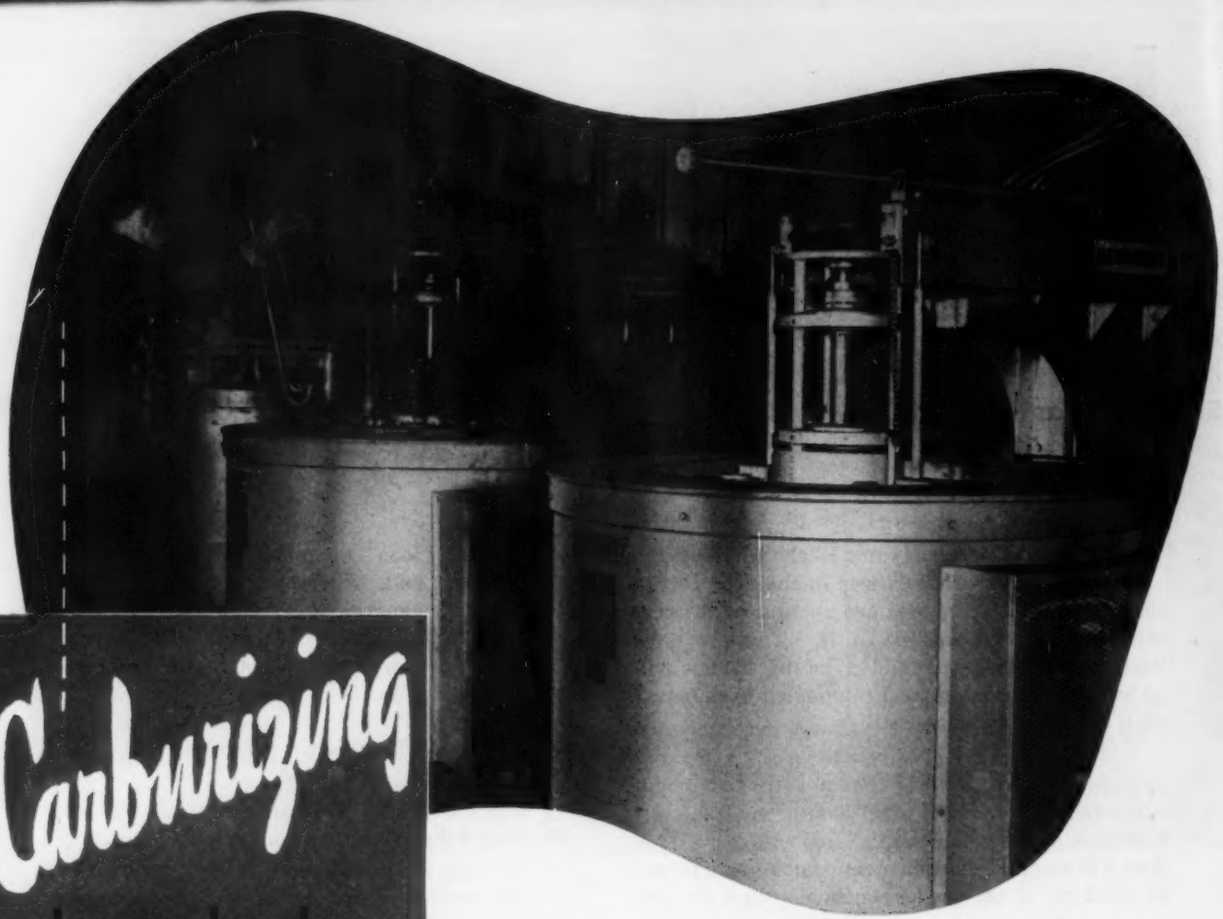
Steel users in the Midwest where pressure for delivery is strongest, are pushing production hard. They want as much flat-rolled steel as they can get and, of course, they are not being satisfied. In general, they report that mills are 2 to 5 weeks behind on deliveries. This pushing of current production does not mean that manufacturers are desperately trying to satisfy a terrific demand for their products. Rather, it seems more like an effort to grab off business while the grabbing is good.

Plate is an example. Plate demand is good but the plate fabricator who complains that he can't get delivery in less than 5 weeks cools off when he talks second quarter business—he wants plate now to get orders by promising quick delivery. This seems to be true in the automotive and appliance fields, too. Appliance makers are putting out their products at a tremendous future rate and at the same time planning great sales promotion projects for the near future. Conversion deals are still being arranged by some auto companies for the second quarter but belief is that they are hedges, not proof that auto demand will be as strong then as it is now.

The Chrysler strike will make no immediate difference in the steel supply situation in Detroit. Chrysler suppliers have been told to take in steel according to earlier schedules. The flat-rolled pressure is still on; hot-rolled and pickled is particularly rough. Automakers still say they are optimistic but indications are that production will be shut off the minute the industry is convinced that dealer stocks are out of hand.

U. S. Steel Plans 2 Million Ton Mill

U. S. Steel will definitely build an eastern seaboard mill on its land near Trenton, N. J. Construction will start in 1951 and ingot capacity will be approximately 2 million tons. Emphasis will be on flat-rolled products. Within the next 5 years ore from Venezuela is slated to start coming in, eventually reaching 10 million tons a year. Part of it will be used by the eastern seaboard mill and part will go through Mobile to U. S. Steel's subsidiary, Tennessee Coal, Iron & Railroad Co. for smelting at Birmingham.



The Western Automatic Machine Screw Company, Elyria, Ohio, uses two Hevi Duty HD-1848 Vertical Retort Furnaces.

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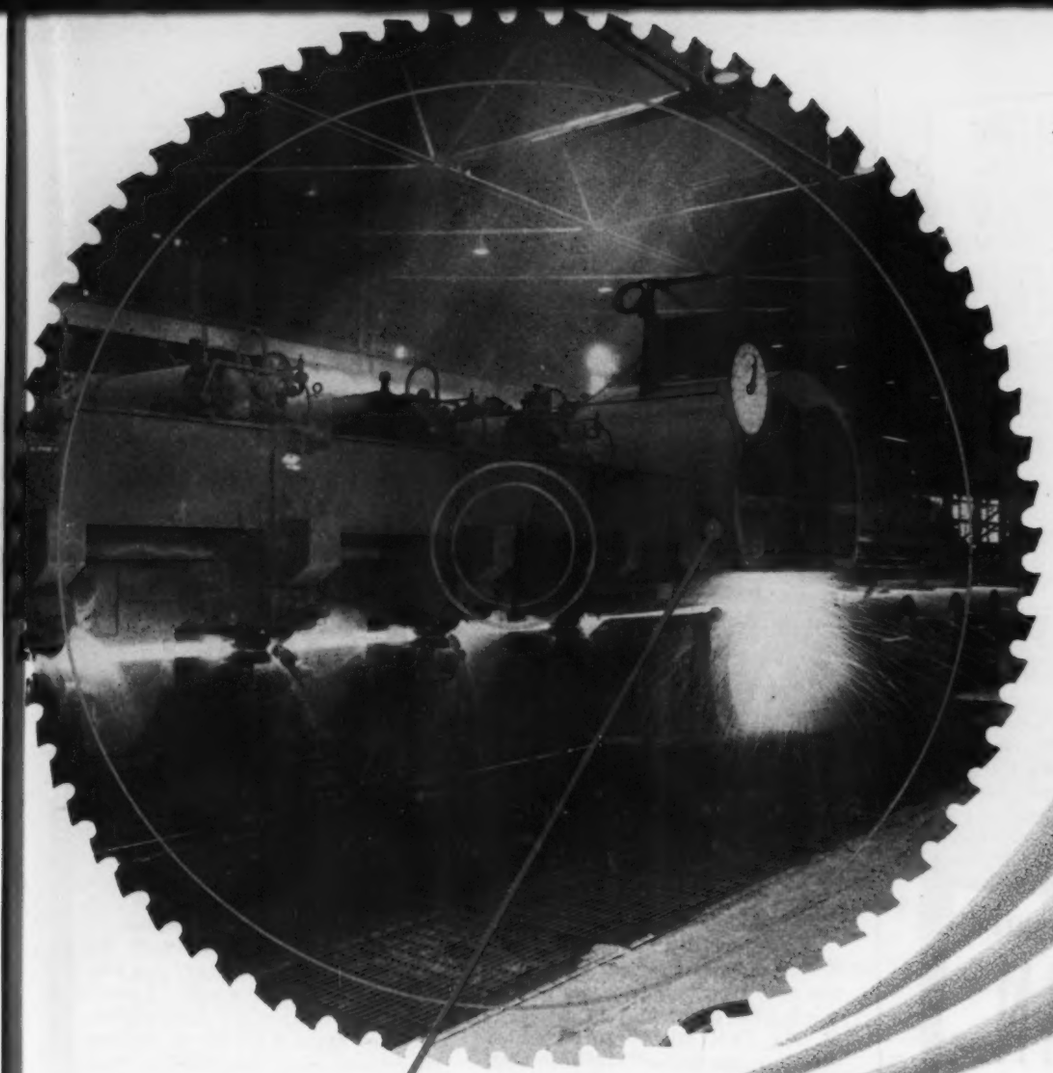

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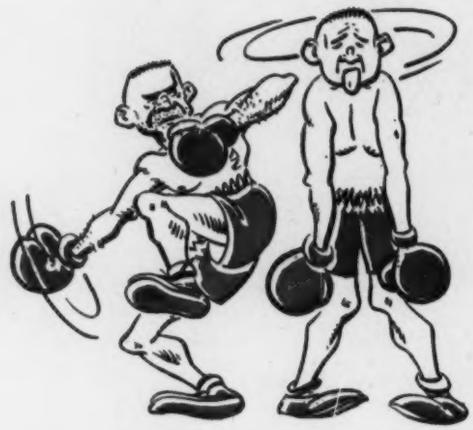


Fatigue Cracks

By Charles T. Post

Mould

While the Gray Iron Founders Society is getting gray hairs over the *grey* iron foundries, we have a word from C. F. Mayer, president of The Carl Mayer Corp., which does business impartially with both gray iron foundries and grey iron foundries:

"Now, tell me which is correct, 'mold' or 'mould'? We build 'mold' ovens for foundries, but note such advertisers as Valley Mould & Iron Corp. refer to 'moulds.'"

All we know is what we read in our 1920 Webster's unabridged, and Webster is sitting squarely on the fence. Sometimes we get a line on preferred spelling by checking the foreign language dictionaries which we use to keep in touch with your f.f.j.'s friends across the pond. On mold-mould, they're pretty discreet. Appleton's New Spanish Dictionary plays safe by giving the translation under both spellings, but McKay's Italian-English refers *mold* seekers to *mould*. Cusset's invaluable English-French Technical Dictionary gives the single translation of mold (*moule*) but if you're thinking about cast iron, sand, or bricks you have to turn to mould to get the full treatment.

Our main interest in the matter is getting plenty of mold in our roquefort, but, surprisingly, the French Technical Dictionary doesn't even mention roquefort. Probably, they consider good roquefort an art beyond the technical realm.

Cybernetics?

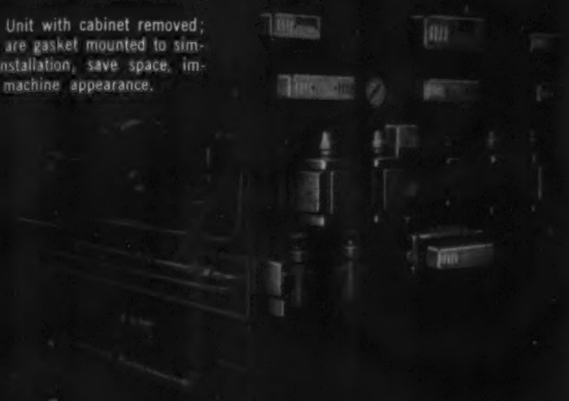
Gilbert Lindgren of Troy, N. Y., wants to know, "Where are you getting all these new words? I can't find them in any of my dictionaries, and you know a lot of us readers have spent more time making steel than we have in schools. I found your item on onomatopes and aptronyms. How about 'cybernetics'?"

Aptronyms are like the old ox road. You'll never find out what they are by looking in any book but your f.f.j. Onomatopes are rare specimens we dug up one day while browsing through the dictionary and dissected in full view of everybody. What they are, we don't just recall. But we don't remember having met cybernetics, let alone using them. To make it worse, we can't find them in our dictionary, so Mr. Lindgren is one up on us there. It sounds like a pretty serious charge, though, something like perjury or treason, and if he can prove it on us, we'll have to ask Mr. Hiss to move over.

Comparator

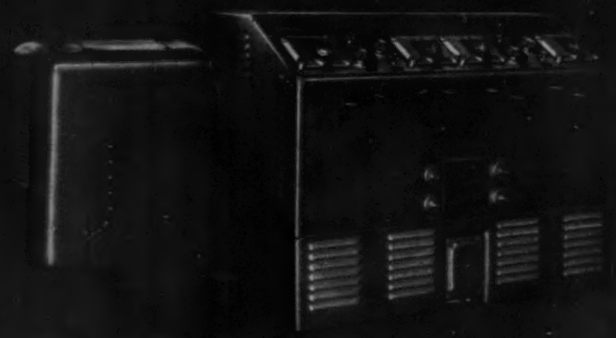
We're thinking of writing a complaint similar to Mr. Lindgren's to National Tool Co., Cleveland. In describing its new pocket comparator, National Tool says, "The lens is a triplet-design aplanatic type. . . ." Even if we had spent our time inspecting small parts or small di-

Turn to Page 171



Power Unit with cabinet removed; valves are gasket mounted to simplify installation, save space, improve machine appearance.

Power Unit having pump driven by standby gasoline engine.

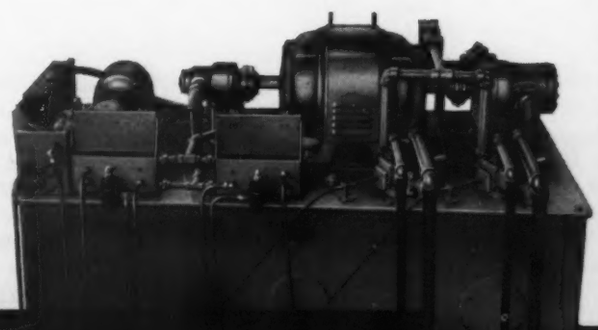


VICKERS Hydraulic POWER UNITS *Custom Built*

Illustrated here are representative examples of the infinite variety of self-contained hydraulic power Units that are designed and built by Vickers for the more efficient operation of many kinds of machinery. These compact Units include all necessary pumps, valves, intermediate piping, reservoir, hydraulic accessories, motors and controls. Hydraulic connections to the machine are grouped in a convenient manifold.

Design is simplified because arrangement is not limited by structure of machine. Installation time and cost are substantially reduced because all hydraulic equipment is received as a self-contained "package" instead of separate parts that must be individually installed. Every Unit is pretested at factory and is ready for immediate operation. Cabinets which are optional, blend well with modern machine design. Operating adjustments and maintenance are simplified by convenient layout and gasket mounted valves. Vickers Custom Built Power Units have other important advantages . . . ask for Bulletin 47-45 and 46-43.

- **Simplify Design**
- **Reduce Installation Costs**
- **Improve Appearance**
- **Save Time**
- **Easier Maintenance**



Power Unit is placed in base of machine . . . console control where convenient to operator.

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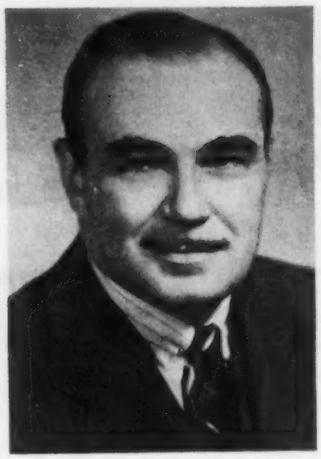
Iron Age *Introduces*

WILLIAM J. MURRAY, manager of the fence department, Copperweld Steel Co.



A. S. BASIL, assistant general sales manager, Kaiser Aluminum & Chemical Sales Inc.

LEON F. MILLER, vice president in charge of sales and engineering, Osborn Manufacturing Co.

William J. Murray received the appointment as manager of the fence department of COPPERWELD STEEL CO., Glassport, Pa. In his new capacity, Mr. Murray will head the sales and installations of Copperweld chain link fence, barbed wire and other Copperweld products.

Howard A. Schroedel was elected to the post of vice president of the TURNER CONSTRUCTION CO., in charge of the Philadelphia office, succeeding **Ernest R. Bear** who has recently retired.

Fred W. Schlapp has been appointed sales engineer for the AJAX ELECTRIC CO. of Philadelphia. Mr. Schlapp will maintain offices in San Francisco from which he will cover northern California and Nevada.

A. S. Basil has been named assistant general sales manager to direct the national sales of aluminum electrical wire and cable products for KAISER ALUMINUM & CHEMICAL SALES INC., with headquarters at Newark, Ohio. **H. W. Biskeborn**, who has been a member of the production department, was transferred to electrical cable sales as technical director.

P. C. Buck was made vice president in charge of production of ACHESON COLLOIDS CORP., Port Huron, Mich. Other appointments included **M. W. Reynolds**, new vice president in charge of sales, and **Raymond Szymanowitz**, new vice president in charge of research. All three men are veterans of the Acheson organization, having been with the company for 30, 25 and 24 years respectively.

Leon F. Miller was elected vice president in charge of sales and engineering of the foundry machinery division of OSBORN MANUFACTURING CO., Cleveland. Mr. Miller joined the company in 1929, after having attended Case Institute of Technology in Cleveland. For the last six years he has been sales manager, and for ten years prior to that was sales engineer in Ohio and the southern states.

Dr. Irven Travis, who is in charge of electronic research at the BURROUGHS ADDNG MACHINE CO., Detroit, was elected a director of the company.

R. W. Brown, was appointed eastern division advertising manager of the COLORADO FUEL & IRON CORP. of Denver.

ANDREW CARRIGAN, assistant vice president of the central sales division, Columbia Steel Co.

Andrew Carrigan has been appointed assistant to **Harold Q. Noack,** division vice president of the central sales division of COLUMBIA STEEL CO., San Francisco. Mr. Carrigan joined Columbia in 1938 and before his advancement was manager of sales for the central division.

Harlen F. Mura of the NORTHEAST EQUIPMENT CO., Cleveland, has been appointed Ohio district representative for the industrial furnace division of the R-S PRODUCTIONS CORP., Philadelphia.

R. C. Fuller, who has been with Pacific division, BENDIX AVIATION CORP., North Hollywood, Calif., for the past nine years, was named general manager of the division.

Turn to Page 134

Iron Age Salutes

WILLIAM P. KIRK

SOME people have an impish grin which is almost a facial chuckle. They usually have a good sense of humor and they always get a lot out of living. And if you check this closely with their record among people you always find they are well liked wherever they go.

There is one fellow like that—among many others—in the machine tool industry. He recently decided to retire but not on the general accepted tradition that he was all through and was going to just rest. Not William P. Kirk.

When he officially retired from Pratt & Whitney early this year he was still slated to be an active consultant for the firm. And what's more he intends to show up at the machine tool meetings wherever they are. He has usually been vocal at them in the past. There is no reason to think he will change.

That so-called land of rest when you retire is not for Bill Kirk because he belongs to so many associations that life will never be dull. It is even a tossup if he will have a chance to play as much golf (he checks scores closely) now as he did when he was vice-president and sales manager of Pratt & Whitney.

IRON AGE salutes Mr. Kirk because he has been an active figure in the machine tool industry. Because he has friends all over the place. Because he has a ready wit of the exceedingly dry kind. And because although he says he is retiring we know the machine tool industry has not lost him at all.

Mr. Kirk worked 43 years for Pratt & Whitney, division of Niles-Bement-Pond Co., West Hartford, Conn. He started with the company in 1907. And he sure knows a lot about Cincinnati because he spent 15 years there. Then he went back to Hartford.

He ought to be called a cosmopolitan of the machine tool industry. That he is. He is not only popular in this highly individualistic group of industrialists but he is respected as well. That is an enviable position.

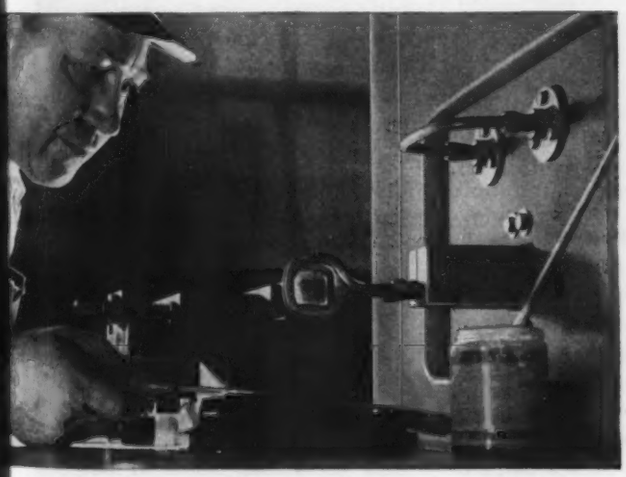
Mr. Kirk does not like to think that his retirement means that he is out of the swim. That he surely is not. And even if he thought he was going to drop out of the picture he would have another thought coming. Those who know him and those whom he has helped with his knowledge and experience would never let that happen. And besides he is one of the best story tellers in the industry. That's worth something these days.

let's get down to earth!

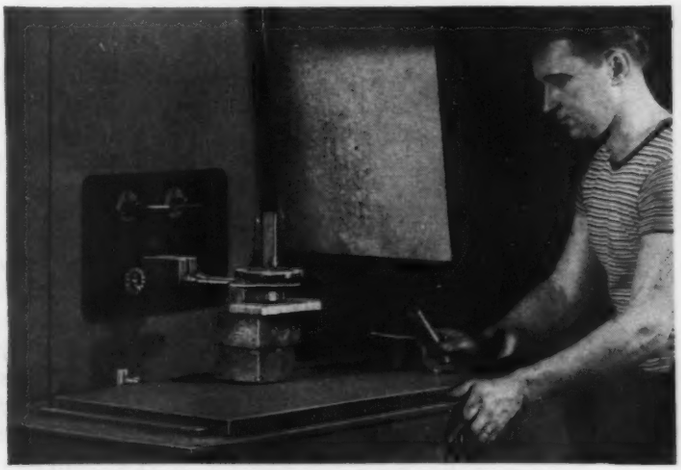
Induction Heaters Are Ideal For Job Lots

PRODUCTION RATES RAISED as much as 500% when this 20-kw unit took over the processing of 11 parts (from driving pinions to trimmer blades) at a southern machinery company. Only a switch of work coils is needed to change jobs. Hardening, brazing and annealing are all done on the one machine. Takes only a minute to switch from job to job.

NO SKILL NEEDED to operate the Allis-Chalmers induction heater on this annealing job according to the midwest manufacturer now using the unit. The same heater is also used for brazing fittings onto cases — with only a change of work coils. Annealing of cases takes nine seconds. Brazing two fittings at a time takes 15 seconds.



15 SECONDS is all it takes this big user of cutting tools to braze tungsten carbide tips to tool bits. A relatively unskilled operator does the job well. And it takes him less than a minute to change the work coil to handle a different size tool. The simplicity of Allis-Chalmers induction heaters makes them ideal for job or production work.



NO SPECIAL TRAINING needed to change work coils — no additional output transformers or capacitors needed. Allis-Chalmers induction heater is ideal for either production or job work. Unit shown does hardening, brazing, annealing, and soldering of small runs and individual pieces. No special work-handling equipment is required.

GET EXPERT ENGINEERING HELP! Allis-Chalmers engineers and methods experts will completely process samples of your work . . . suggest and design simple, effective work handling equipment, and quote per piece production and equipment costs. Standard ratings: 1, 2, 10, 20, 50, 75, 100, and 200 kw.

Check with your nearby Allis-Chalmers representative regarding this offer — or write direct.

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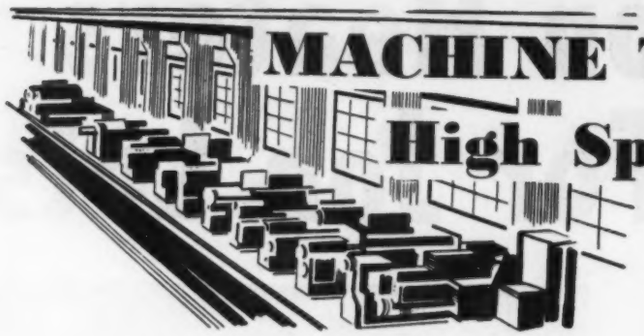

MACHINE TOOL High Spots

Sales Inquiries and Production

by William A. Lloyd

Plans under way to obtain more replacement business . . . Ford will build Cleveland plant . . . New order index drops.

Cleveland—Bold plans for penetrating the replacement market, regarded by some machine tool marketing experts as the potential plum of the new year, were under way in the machine tool industry this week.

Present evidence points to the fact that the number of "in plant" machine tool shows, many of which have been held during the past 6 months, will grow. Feature of most of these shows is one or two new models which, in one way or another, but primarily by doing the job faster, render their prototypes obsolescent.

Surveys Being Made

Where complete sales records are available, surveys of customers' present equipment are being made, and the sales spotlight focused on those machines which the new models specifically replace. Salesmen and distributors are being asked to step up their efforts where obsolete equipment is known to be in use.

All this costs money, however. One sales vice-president recently made the spur-of-the-moment comment that it cost his company about six times as much to get replacement business as it did any other kind.

Others see the automotive industry as the big bonanza of the next 12 months. It is argued that the automobile business will become steadily more competitive, placing additional emphasis on lower unit costs, and thus bring in consideration new tooling of every type.

New Tooling for Detroit

In any event, in Detroit, the Chrysler strike is expected to have little, if any, effect on the machine tool tempo that has been building up for several months. In addition to ordering for a new high compression engine for Chrysler-Jefferson, there has been a marked interest during the past week in new tooling for General Motors' Hydra-Matic. The official announcement that Kaiser-Frazer will use Hydra-Matic on its 1951 models, due in March, was made this past week.

Ford Plans Cleveland Unit

As reported several weeks ago in these columns, it has been officially announced that Ford will build a production foundry and a motor plant on a 200-acre site adjacent to the Cleveland City Airport. Informed sources report the new Ford in-line six-cylinder engine will be built at Cleveland, while a new Ford V-8, which is scheduled for early release, will be built in Detroit.

Reports indicate that tooling for the new Studebaker automatic transmission has now been placed. There has been some recent ordering by Dodge for its engine plant and also by the Chevrolet Div. of General Motors. In addition to automotive buying, small shops in this area have shown an increasing interest in new and more modern tool room equipment, according to trade sources.

Rivett Lathe Diversifies Line

Indicative of the fact that the trend in the machine tool industry toward diversification of production is anything but dead, Rivett Lathe & Grinder, Inc., Boston, has announced purchase of the entire line of Gerotor air and hydraulic valves, cylinders and hydraulic power units from Gerotor May Corp., Baltimore. All manufacturing and selling operations of the line are being transferred immediately to Boston, with no interruption in acceptance and delivery of orders.

Gerotor May Corp. is retaining the manufacture and sale of Gerotor hydraulic pumps and fluid motors at Baltimore. The new Rivett line will be marketed through the present Gerotor dealer organization, which will continue to handle Gerotor hydraulic pumps and fluid motors.

Machine Tool Index Drops

In Cleveland, index of new orders for machine tools compiled by National Machine Tool Builders' Assn. dropped to 82.5 in December from 84.3 the preceding month. Index of foreign orders, which are included in the new order index, rose to 22.4 from 17. Index of December shipments was reported at 75.7 compared to 67.6 for November. Ratio of unfilled orders to shipments dropped from 3.7 to 1 in November to 3.4 to 1 in December.

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There's only *one* Trav-Lift! P&H builds it! But it's available in capacities up to 15 tons — with various lifting speeds and spans — with floor or cage control. In short, your Trav-Lift is tailored to fit your specific needs.

Designed and built with the same safety factors as a heavy-duty crane, standardized designs and lower costs make the Trav-Lift your best bet wherever service needs do not warrant investment in a heavy-duty crane.

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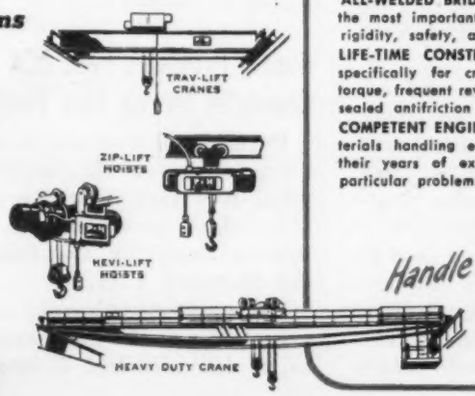
Trav-Lift Capacities Run up to 15 Tons

See how the P&H Trav-Lift Crane can bring you new and broader economies in materials handling. Write for Bulletin H-13.



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COMPETENT ENGINEERING SERVICE — P&H materials handling engineers will gladly give you their years of experience in working out your particular problems. Write us.

Handle it "thru-the-air" at lower cost

GLOBAL LETTER

REVIEW OF WORLD MARKETS

Britain will show latest machinery at its Industries Fair . . . 1949 was record year for steel industry . . . Capacity increases listed . . . Hoffman seeks ECA accounting.

London—A striking cross-section of the production of Britain's machinery industry will be seen in the Engineering and Hardware Section of the 1950 British Industries Fair (London and Birmingham, May 8 to 19).

Emphasis is to be laid on the growing importance of press working, diecasting and plastic molding in industry.

Record Year in Steel

The British steel industry has just completed a year in which a new production record was established in each month except July which was affected by holidays. Total production during 1949 was 17,419,248 tons.

The British Iron and Steel Federation believes that steel production in 1950 should register a further increase, giving an output for the year of around 17,640,000 tons.

Several modernization and expansion plans should contribute to this increase. Among them are: Reconstruction of the melting shop at Round Oak Works (Staffordshire) where capacity will be raised from 179,200 tons a year to 290,000 tons; installation of a new blast furnace, ore handling plant and melting plant at Skinningrove Works (North East Coast) where ingot capacity will be increased by 112,000 tons a year; and the installation of a new openhearth furnace at Stewarts and Lloyds (Corby) where capacity will be raised by 156,000 tons a year.

Big Drop in Imports

The greatest increase in capacity represented by any single development plan is that of over a million tons a year at Margam in South Wales. However, this will not be available until 1951.

The Federation says there should be a further reduction of imports in 1950. They should fall from the 1,344,000 ingot tons reached in 1949 to about 952,000 ingot tons. In the industry's postwar development plan, and subsequent international discussions normal import requirements are placed at 560,000 tons.

Knotty Problems Face ECA Countries During This Year

Paris—Paul Hoffman, Economic Cooperation Administrator, arrived here last week for discussions which are expected to go far toward clarifying the future of the Marshall Plan.

He is expected to make another exhortation to the Europeans such as he delivered last October. He is also expected to seek an accounting with the various countries participating in the plan. He will use this information in reporting to Congress how the plan stands at nearly the half-way mark, and what may yet be accomplished.

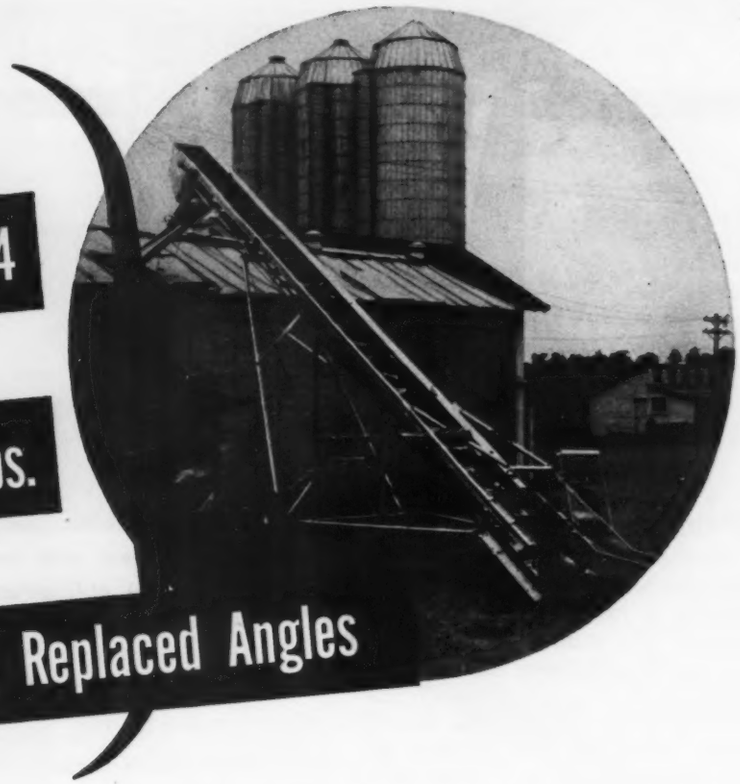
Must Lower Trade Barriers

The forecasts of the Marshall Plan countries show that their current dollar deficit in the last year of the plan will be about $2 billion. They expect that the dollar shortage will remain, though reduced, when the plan ends.

Most Europeans believe that the integration urged by Mr. Hoffman must be slow and painful—that it cannot greatly contribute to overcoming the dollar shortage. They don't believe that the U. S. can maintain its exports at about $12 billion a year if it imports only about $7 billion, unless it is to go on giving away exports or financing its foreign customers in some way. They regard lower U. S. trade barriers and more development of exportable European resources as the solution of the problem for both.

On the brighter side, ECA countries will report about 50 pct reduction in import quotas.

The subject of lowering trade barriers is bound to come up for plenty of discussion. Each country admits that this is a vital and necessary step for the success of the plan but complete agreement has not yet been worked out.



Cash Saved.....$9.44

Weight Saved...161 lbs.

When Armco Tubing Replaced Angles

This cost/weight saving was the happy experience of a farm equipment manufacturer who redesigned a portable grain elevator, replacing angles and channels with 1 ¾" and 2" O. D. Armco Steel Tubing.

The $9.44 saving on each elevator is in material costs alone. Besides this saving, the elevator is fabricated and assembled easier and quicker than when heavy angles were used.

Dealers and their customers are pleased, too. They like the "new look"—the improved appearance of round Armco Tubing compared with bulky angles. They also like the lighter weight without loss of strength. (Total weight of the tubing is 128 pounds; the angles weighed 289 pounds.)

This is a typical example of the savings in cost and weight that are possible when light structural products are redesigned with Armco Steel Tubing.

STANDARD OR SPECIAL SHAPES

The beauty of it is that this electric resistance-welded mechanical tubing can be adapted readily to almost any fabricating pattern you require. Made-to-order special or standard shapes help eliminate or greatly reduce many costly fabricating operations.

If you believe the design of ***your*** products can be adapted to the economical use of Armco Steel Tubing, just mail the handy coupon. Armco engineers will be glad to work with you to determine the possibilities of tubing for your requirements.

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PUBLICATIONS

New publications that describe money saving equipment and services are available free and without obligation. Copies can be obtained by filling in the attached card and mailing it.

Shipping Containers

How parts may be sealed, stored, and shipped in air-tight steel containers is explained in illustrated folder. The elimination of boxing and crating, shipping damage, corrosion and rust are some of the claimed advantages for the use of these containers now available in 4 to 55-gal capacities. *Steel Drum Packaging & Acc., Inc. For more information, check No. 1 on the postcard.*

Galvanizing Furnaces

The patented burner settings and combustion system of F.E.I. galvanizing furnaces are described in a new illustrated folder showing how fully automatic controls prolong kettle life and increase production. *Furnace Engineers, Inc. For more information, check No. 2 on the postcard.*

Hot Water Tanks

Twelve page booklet describes Stone Steel hot water tanks made of U.S.S. Cor-Ten, a steel combining high strength and atmospheric corrosion resistance with ease of fabrication. *United States Steel Subsidiaries. For more information, check No. 3 on the postcard.*

Steel Characteristics Chart

A plastic-laminated wall chart, measuring 16¼x21 in., shows the working characteristics of steels from —300°F to 2900°F, with temperature zones in nineteen colors approximating hot-body radiant hues, definitions and explanations of 23 metallurgical terms, and a diagram symbolizing change in grain size with temperature. Available to industrial executives who request it on company stationery, stating their position. *Tempil® Corp. For more information, check No. 4 on the postcard.*

Leak Detector

New 4-p. bulletin describes typical applications for Veeco Mass Spectrometer Leak Detectors, wherever a vacuum, fixed pressure or special atmosphere must be maintained for extended periods of time, and gives pertinent data on vacuum and pressure testing, with explanatory illustrations. *Vacuum-Electronic Engineering Co. For more information, check No. 5 on the postcard.*

Short Run Stampings

A complete service for short run stamping is described in a folder outlining cost-saving production of parts requiring blanking, piercing, forming drawing, extruding, stenciling, drilling or tapping. *Federal Tool & Mfg. Co. For more information, check No. 6 on the postcard.*

Combination Lift Truck

The Lull Traveloader, a combination fork-lift and motor truck available in 1½, 5 and 15-ton capacities, is described in a 4-p. folder showing applications and specifications for this self-loading and transport truck capable of handling material up to 66 ft long at speeds up to 30 mph. *Lull Mfg. Co., For more information, check No. 7 on the postcard.*

Speed Reducers

Two new vertical gear shaft worm gear speed reducers, types NU and ND, are described in an 8-p. bulletin containing cross-sectional views, overhung load capacity charts, standard dimensions and specifications. *Cleveland Worm and Gear Co. For more information, check No. 8 on the postcard.*

Arc Welder

Self-indicating dual continuous control is one of the features of the new Shield-Arc welder described and illustrated in the 12-p. booklet offered. *Lincoln Electric Co. For more information, check No. 9 on the postcard.*

Stamping Facilities

Facilities for the mass production of automotive and other types of stampings are listed and illustrated in 4-p. bulletin including photos of recently made industrial

Turn to Page 149

AMERICAN WELDING

"Controlled Technique"

is more economical for YOU!

Rings, bands and weldments, fabricated by American Welding "Controlled Technique" will *save you money!*

All types of resistance and fusion welding applicable to ferrous and non-ferrous metals and alloys. Heat-treating and machining facilities are available.

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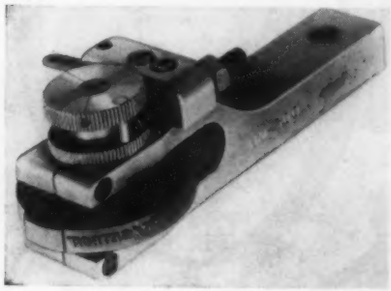
work cycle, is marked, and clears, like other tools. The marker is suitable for both light and heavy work on automatic and hand operated screw machines, bench and



turret lathes, etc. Drag of the roll die on the work has been eliminated by providing a cut-out at end of the last character, which also prevents double impressions. Resetting of the roll marker is automatic as the holder is retracted from the work. Need for special drawings of die blanks for each die is eliminated. *New Method Steel Stamps, Inc. For more information, check No.* 35 *on the postcard on p.* 35.

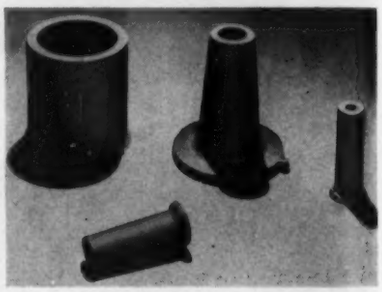
Contour Machine

Time savings up to 90 pct in cutting, filing and file broaching are claimed for a new, all-purpose combination contour saw and band filer. It is a portable, compact, rugged and accurate machine suited to the needs of tool and die shops, laboratories and machine shops. Precision filing and file broaching to a layout finish line and flash removal are accomplished in one-ninth the time of hand methods and ¼ the time of reciprocating filing machines, it is reported. Speeds range up to 4100 blade fpm for cutting wood and down to 92 blade fpm for cutting metals. Quick-change, ball-bearing equipped gear box and step pulleys

make any one of eight speeds instantly available. *Boice-Crane Co. For more information, check No.* 36 *on the postcard on p.* 35.

Centrifugal Castings

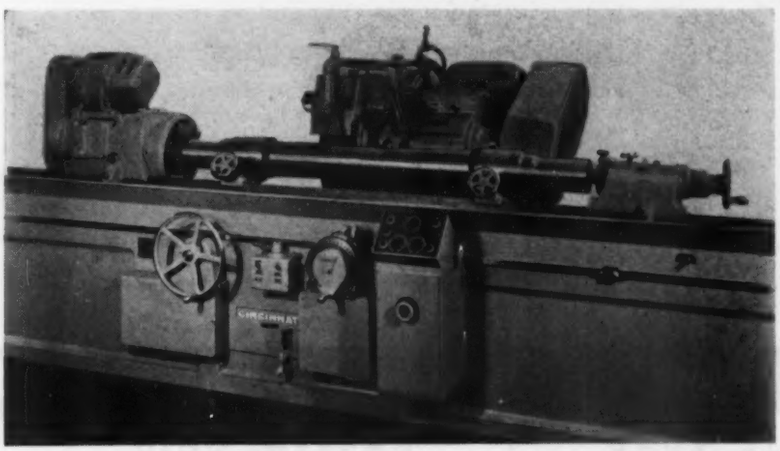
Recommended for parts requiring an extremely dense and compact structure, centrifugally cast liners, rings, rolls, sleeves, bush-



ings, etc., are being supplied in all metals. Such castings are blanked to customers' specifications assuring a minimum of metal to be purchased and machined. *American Non-Gran Bronze Co. For more information, check No.* 38 *on the postcard on p.* 35.

Grinding Machines

Many features of value in grinding medium to large sized parts are incorporated in the new Filmatic 14 and 16 in. plain grinding machines. The grinding wheel spindle runs on Filmatic bearings. These bearings consist of multiple segments, fixed axially but free to rock radially a slight amount. Upon rotation of the spindle, wedge-shaped oil films form between the segments and spindle diameter, and build up to high pressures, automatically adjusting themselves to variations in forces created by the grinding action. Lubrication of bearings is automatic, with circulating filtered oil. Should the lubricating system fail, the grinding wheel drive motor automatically stops. The table is traversed by means of a rack and pinion and a simple drive from the motor. Traverse rates are infinitely variable between 3 and 120 ipm, through a dc motor controlled electronically from an ac source. *Cincinnati Grinders, Inc. For more information, check No.* 37 *on the postcard on p.* 35.



Metal Fabricator

The Wales metal fabricator punches, notches and nibbles up to ¼-in. thick mild steel. Rapid interchangeability for punching, notching and nibbling is one of the features of the machine. The quick change holder permits the changing of punches and dies for various round and shaped hole diameters in a matter of seconds, and automatically aligns punches and dies.

Turn to Page 154

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On the ASSEMBLY LINE

AUTOMOTIVE NEWS AND OPINIONS

Chrysler strike looks like a long one . . . Union is demanding 10¢ as pension package or wage boost . . . K-F shows its new cars to the press . . . Ford-Cleveland plant official.

by Walter G. Patton

Detroit—At the moment there is every indication the Chrysler strike will be a long one. While a settlement could come in a week, automobile history has shown that strikes hitched to fundamental issues between a car producer and the union have a habit of extending themselves.

For example, the now famous "Look at the Books" GM strike lasted 113 days. Here the issue was the rights of management vs. the rights of labor. The Ford strike of last spring over the fundamental speedup issue cost Ford 25 days of auto production and Ford workers an estimated $18 millions in wages. Now comes the Chrysler stoppage which is mostly concerned with administration of the pension fund.

Explaining Their Positions

Both the company and the union took full page advertisements in Detroit papers last week to explain their respective positions. Herman L. Weckler, vice-president and general manager of Chrysler Corp., claimed that if the union demand for pensions and insurance benefits is an honest demand, the company has already met it—it has offered to guarantee pensions of $100 per month, increased life insurance, improved sickness and accident and disability benefits.

Union Presents Its Case

Mr. Weckler said that what the union leadership really wants is a "kitty" it can get its hands on for other purposes. "That is the only plausible excuse for its demand that regardless of Chrysler's guarantee to pay pensions to retiring employees, 10¢ an hr must be set aside in a fund over which the union can share control," he said.

Chrysler said the economic benefits of its offer to the union compared "favorably" with the agreements reached in the steel, glass and rubber industries *where there is no cost-per-hour equivalent.*

In its arguments to show that the union position is reasonable, the UAW-CIO made clear that its demands total 10¢ per hr which could be paid either as a pension and insurance package or as a straight wage raise. The 10¢ demand, the union argued, is "very modest." Chrysler's profits would easily permit such a wage increase, the union said. The advertisement went on to publish the salaries and pensions for top Chrysler executives.

Claims Difficult to Evaluate

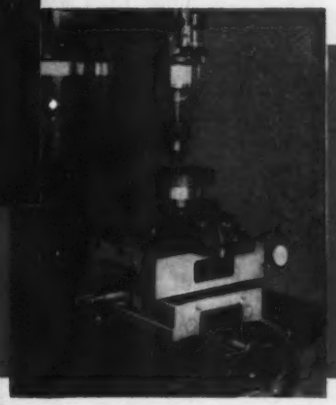
The union further contended Chrysler would be able to meet its pension obligations for as little as 3¢ per hr. If this is true, a 10¢ contribution would soon build up to a formidable fund at Chrysler.

It is difficult to evaluate the respective claims of the two sides involved in the Chrysler dispute. Anti-union observers are inclined to dismiss the strike as just another "attempted power grab" by Walter Reuther. These critics discount liberally the union contention that their 10¢ wage boost offer invalidates the power grab argument.

Meanwhile, the forgotten man in this dispute appears to be, as usual, the Chrysler workman who could have had his pension—if indeed he wanted it—without the loss of a day's work. It is doubtful that the average Chrysler worker is much concerned whether the pension is going to cost Chrysler 3¢ or 10¢ just so long as he gets a $100 check every month after he retires.

That Little 4 x 4— BULLARD SPACER ...does it do a JOB!

Drill spacing with jigs is now proved to be an expensive art compared to the semi-automatic spacing with Bullard Spacer. No need for designing and making jigs for new jobs. Even throw out the old jigs and operational savings will start.



Unique installation of Bullard 4x4 Spacer on a Tool Room Milling machine.

Himoff Machine Company, Long Island City, New York, says, "It saves time on small lots and accurately drills, reams, taps and counterbores. Jigs and layouts are eliminated."

For larger work, the 30 x 20 Spacer on 4', 5' or 6' Radial Drills with Accurate Spindles.

The complete story is told in Bullard's 16 MM. sound film entitled, "Interchangeability Without Jigs."

Write for literature on Bullard Spacers. Two sizes, 30 x 20" and 4 x 4".

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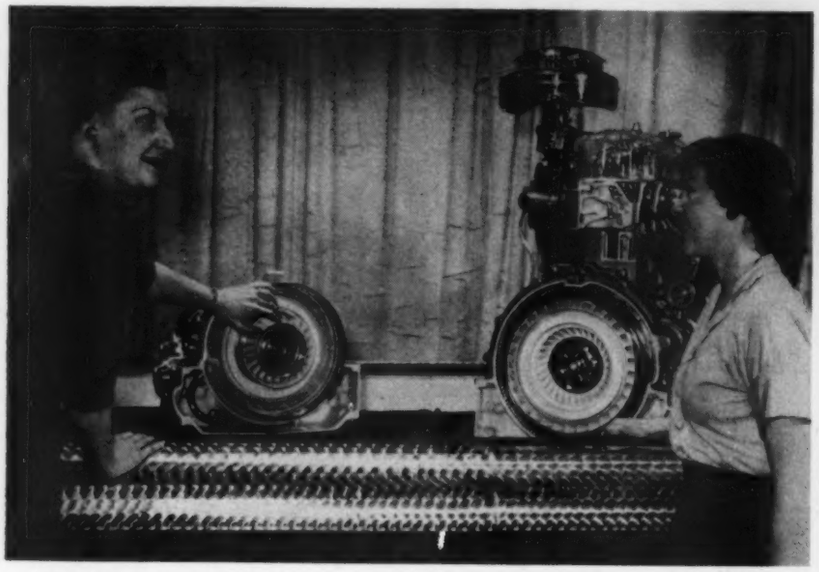

HERE'S HOW IT WORKS: Shown in the photograph is a cut-away exhibit disclosing the features of the new 105 hp Chevrolet engine and powerglide automatic transmission. Each of the display units makes a complete revolution, separating the two halves of the torque converter unit. This permits a view of the turbine, pump and stators. When the two units again reach position, they move forward and join as part of the "Power-Team".

Union's Position Strong

The union's position in the strike is strong even if one assumes the UAW-CIO does not have the best strike issue. The stoppage has hit Chrysler just when the company is preparing to boom its production in anticipation of a big spring selling season. Also—and most importantly—after the strike has been in effect 2 weeks, the union will begin to collect $1 per week from all non-striking UAW-CIO workers under the terms of a resolution passed at the recent Milwaukee convention. Returns from this provision could bring in several hundred thousand dollars per week for 12 weeks to finance the Chrysler strike.

Looking ahead, Mr. Reuther may have in mind another battle on fundamentals with General Motors. Unless union strategy is changed a GM strike could develop over the issue of a closed shop.

Ford Will Build Cleveland Plant

Reports appearing in THE IRON AGE for the past month that Ford Motor Co. is going to build a production foundry and motor plant in the Cleveland area were confirmed last week. Ford has bought a 200-acre site adjacent to the Cleveland City Airport. Two new buildings will provide approximately 1,700,000 sq ft of plant space and employ 10,000 workers.

Trade sources indicate the first production at Cleveland will be a new six-cylinder high compression engine. This will permit modernization of the present Rouge foundry and motor unit where it is expected Ford's new high compression V-8 engine will be built.

Construction will take 2 years. The contract has been awarded to Albert Kahn, Detroit.

Kaiser-Frazer Dealers, Press View New Models

At the moment Kaiser-Frazer dealers are seeing for the first time the Kaiser and Frazer 1951 lines of cars. If Henry Kaiser's luck is as good as his new cars appear to be, K-F should have its hat in the ring for some time to come.

Body, Engine Changes Made

K-F has been in a difficult position for months. Partly because of large expenditures for tooling of its new models, its financial statement has been heavily on the red side of the ledger. Its $44 million loan from Reconstruction Finance Corp. has been criticized by many persons. In addition, the company is now engaged in litigation that promises to be trying even if K-F wins the suit. Without its attractive new models, admittedly the future at Willow Run would now be very dark.

Last week, Edgar Kaiser effected a remarkable change in the K-F future. The new Kaiser models he showed the press probably elicited as much favorable comment as any new models that have come along since the present Hudson was introduced. In addition to a completely restyled body, K-F will have a more powerful engine. The utility type body that has attracted very favorable attention will be offered in all lines. The Kaiser and Frazer will have GM's Hydra-Matic and Overdrive as optional equipment.

Curiously enough, the new Kaiser drew as much attention as the long-heralded K-F small car which reporters saw last week for the first time. The small car seats five passengers. The grille is a fresh, new design, reminding some persons of the Studebaker. There is a small rise in the rear fenders that reminded others of the Cadillac fin.

The rear seat folds out of the way as in the present Kaiser Vagabond. Access to the luggage compartment is from inside the car. The small car will be powered by a new Willys engine and is reported to give up to 35 miles per gal in the six and as high as 40 miles per gal with the four-cylinder job.

The new small car is not a toy. It looks like a substantial car—although the wheelbase is obviously less than a Ford, Chevrolet or Plymouth.

K-F Needs Good Dealers

K-F's future in the automobile industry will be strongly hinged to the price of its new cars and to its ability to attract good dealers. K-F needs badly a break in dealer building and a respite from political attack to build up confidence in its future.

The company has already produced more cars than 90 pct of the new car entries to fall by the wayside. K-F commenced building cars at a time when it had literally to make new materials grow that weren't even in existence. Its first cars were above average from an engineering standpoint.

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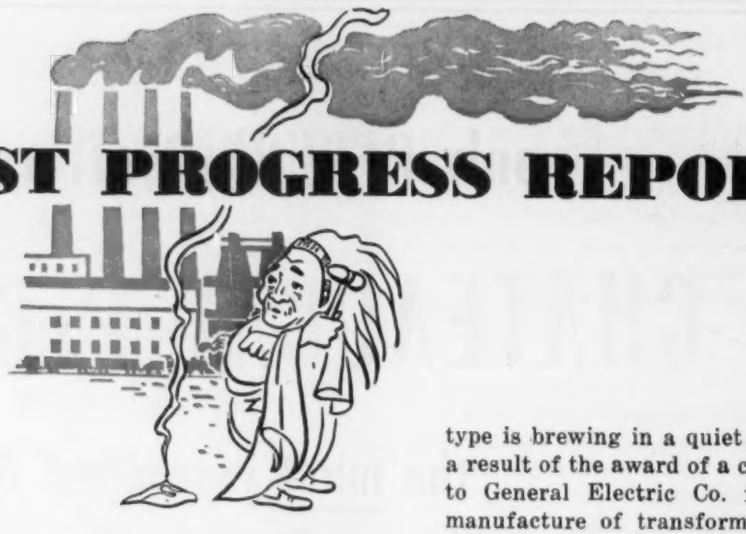
WEST COAST PROGRESS REPORT



Unseasonal weather takes industrial toll in Pacific Northwest . . . Another aluminum producer announced for West.

Digest of Far West Industrial Activity

by J. Reinhardt

Seattle—Heavy industry in the Pacific Northwest has been adversely affected by "unusual" weather to the extent that plant operations have suffered and unemployment increased.

Because of a lack of demand the openhearth furnaces of Bethlehem Pacific Coast Steel Corp. here were down from Dec. 24 until Jan. 19, although the mills at the plant were partially operating. Northwest Steel, as previously reported, has been operating on a limited basis for some time.

Unemployment Rolls Rise

The state of Washington's unemployment rolls hit an all-time high this month when claims were received from 81,772 persons. Even that figure of unemployed was exceeded for at least a few days with many contractors and some industries suspending operations until weather conditions improved.

Pacific Car & Foundry Co. at Renton, Wash., halted all operations for 5 days; Boeing Airplane Co. stopped most production operations for several days; Isaacson Iron Works carried on at about 60 pct of normal and Northwest Steel closed down its scrap yard during the height of the blizzard period but maintained other operations. Absenteeism ran as high as 10 pct during the worst storm period, when sub-freezing temperatures prevailed for several days and snowfall was extremely heavy.

Transformer Contract Awarded

Aluminum plants at Vancouver and Trentwood, Wash., were temporarily affected by the storms when 70,000 kw of electric power were shut off during peak load time but no appreciable loss of production resulted.

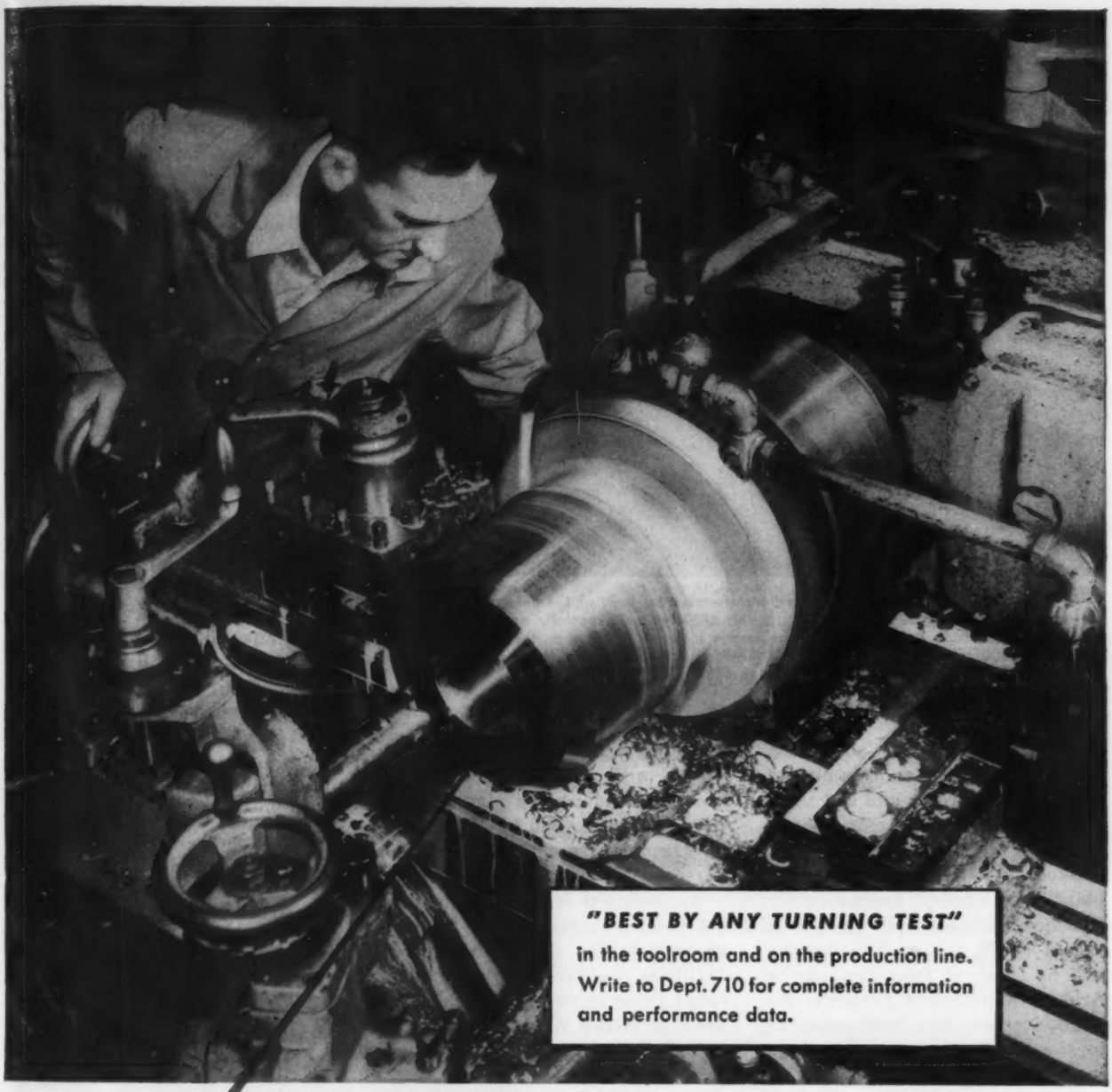
Another storm of a different type is brewing in a quiet way as a result of the award of a contract to General Electric Co. for the manufacture of transformers for the city owned Ross Dam Power House. Two bids by English companies, Ferranti, Ltd., and English Electric Co., Ltd., were approximately $200,000 below the $751,000 bid of the GE Co. In awarding the contract to the American company the purchasing agent for the city of Seattle contended that neither bid exactly met specifications and the request of the Ferranti Co. to permit it to revise its bid in conformity to specifications was unavailing.

It seems that the local businessmen who question the advisability of the purchase as made, are conscious of the fact that the British are very fine customers in the state of Washington. They point out that British Overseas Air Ways Corp. is even now taking delivery of an order for ten Boeing Stratocruisers that cost them nearly $20 million. The objectors also point out that British buy many thousand board ft of lumber each year from Washington mills and are also good customers for Washington orchards produce.

Harvey Machine Plans Aluminum Production on Coast

Los Angeles—Newest aluminum producer in the West, Harvey Machine Co. of Torrance, Calif., will involve construction of a $5 million reduction plant and sheet mill according to Leo M. Harvey, president.

It is reported that Harvey Machine has agreed to purchase from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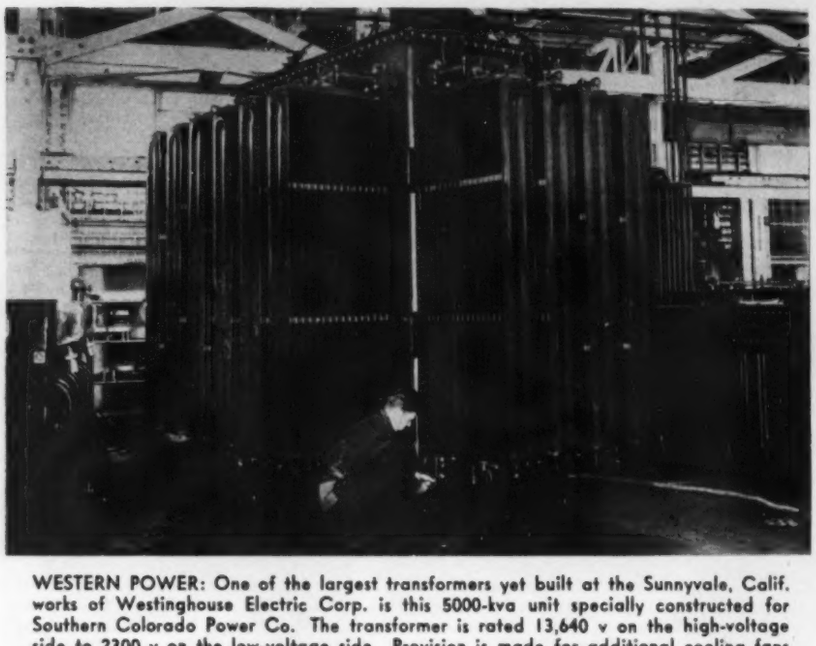

WESTERN POWER: One of the largest transformers yet built at the Sunnyvale, Calif. works of Westinghouse Electric Corp. is this 5000-kva unit specially constructed for Southern Colorado Power Co. The transformer is rated 13,640 v on the high-voltage side to 2300 v on the low-voltage side. Provision is made for additional cooling fans that can be added to raise the capacity to 6667 kva if needed.

the Colorado River Commission part of the Basic Magnesium plant at Henderson, Nev., and 200 acres of land and will use electric power from Hoover Dam.

According to Mr. Harvey the plant will employ approximately 500 men with a yearly payroll in excess of $3 million and bauxite will be obtained from deposits in Arkansas and South America. No announcement has been made as to the start of construction and installation of equipment.

A recent announcement by Governor Vail Pittman of Nevada reported that Combined Metals Reduction Co. of Pioche, Nev., will also purchase facilities of the Basic Magnesium plant for use in the electrolytic refining of ores; and the National Lead Co. is likewise negotiating for facilities with which to produce titanium.

Expects to Open Can Factory

Portland, Ore.—Continental Can Co. expects to open up a branch factory here about Apr. 1 according to I. J. Olsen, manager of the can manufacturing division at Seattle. The factory building was constructed here more than a year ago but because of the inability to get equipment operation was postponed until this spring and machinery is now being placed. The new building is 640 by 400 ft and will employ approximately 100 persons.

According to Mr. Olsen the market in the Portland area has increased to the point where new facilities are necessary and have taxed those at Seattle which have been servicing Washington, Alaska and Oregon.

Autoworkers Join Strike

Los Angeles—Joining the national strike, 1500 CIO Auto Workers struck at the southern California assembly plant of the Chrysler Corp., stopping production on approximately 400 cars a day here.

Dodges, Plymouths, DeSotos, and Chryslers were being run off the assembly line at the Maywood plant of Chrysler.

The local president of the union was in Detroit for negotiations and telephoned the strike order directly to Gene Malcolm, secretary of the United Auto Workers here.

Maintenance workers were allowed through the picket lines to keep machinery in order. Pickets were massed at first but allowed to dwindle off later.

Douglas Aircraft Building The Fastest Supersonic Plane

Los Angeles—Douglas Aircraft Co. at its Santa Monica plant is building the nation's fastest supersonic plane, a joint Air Force-Navy project.

Designated the X-3, the research ship is said to be designed for speeds of about 2200 mph level flight and a ceiling of 200,000 to 300,000 ft.

One of its features will be an ejection seat that hurls the pilot through the floor of the plane in case of an emergency, improving his chance of survival because there is no possibility of hitting the ship's tail surfaces.

In a separate project, the Air Force has been testing a rocket sled, which is triggered to hurl a 180-lb dummy (strapped in a seat) some 20 ft above the speeding vehicle to gain information on the effects of pilot ejection at speeds well above that of sound.

The railway for the sled is the world's fastest, sending the sled, propelled by five 11,000 lb thrust rockets, down the track at 1100 mph. The railway is 2 miles long and the sled weighs 2300 lb.

Latest findings have proved that a pilot can be ejected safely at 700 mph. No manned runs are contemplated in the research project.

North American Aviation has tested successfully at Edwards Field its new ship, the YF-93A, which is designed to penetrate deeply into enemy territory on high speed missions.

"It picks up where other jet fighters leave off," R. H. Rice, North American vice-president, said.

The plane has a swentback wing, such as that of the North American F-86, which unofficially has been flown at 710 mph.

The new ship is designed to fly operationally at speeds close to that of sound.

A Hand Full of Helps and Hints

on how to slash material handling costs in foundries and metal working plants

These actual authorized job studies show and tell how it is done with

PAYLOADERS

Here's a Job Study of a foundry that uses six Model HA Payloader tractor shovels to pick up, carry, pile, spread, windrow, dump and load sand . . . to handle sprues, slag, bond and broken cores. They've taken many laborious tasks off the backs and arms of men, have cut material handling costs substantially and have speeded foundry production without sacrificing flexibility of operations.

Job Study No. 10 pictures and describes how a combined foundry and machine shop uses Hough Payloaders to unload sand from gondola cars, to handle sand and other materials in the foundry, to transport castings in the foundry and machine shop and to load finished products on trucks for shipment.

Both of these Job Studies are full of cost-cutting ideas and are available without obligation. Simply fill out the coupon below and mail it to The Frank G. Hough Co., 733 Sunnyside Avenue, Libertyville, Illinois.

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THE FEDERAL VIEW

THIS WEEK IN WASHINGTON

President Truman's tax proposals will be in for rough sledding . . . Defense Dept. advocates plant dispersal . . . U. S. Steel slated for monopoly hearings.

by Eugene J. Hardy

Washington—Congressional reaction to the President's tax message clearly indicates that Mr. Truman will have to settle for half a loaf or maybe even a little less. Here's how the situation shapes up at this time. Congress is in a mood to cut or abolish some or all of the wartime excises and might even go farther than suggested by the President. His request for $1 billion in new revenue, primarily from increases in estate, gift and corporation taxes to make up for revenue losses from the excise cuts will not be fully complied with.

Measure May Be Vetoed

It appears that the largest amount of new revenue that Congress might authorize would be somewhere between $300 and $400 million coming largely from higher estate and gift taxes. The minimum loss of revenue resulting from excise slashes would be around $750 million, or about 50 pct greater than contemplated new revenue. However, if Congress holds the excise cuts to around $750 million it is not expected that Mr. Truman will veto the bill despite his threat to do so if revenue losses are not made up.

Should he veto such a measure, it is almost a sure bet that the veto would be overridden. On the other hand, if Congress, particularly the Senate, runs wild on excise taxes and the cuts should entail revenue losses of $1 billion or more, the President is sure to veto the bill and the veto would very likely stick. If the situation really gets out of hand there might not be any tax legislation this session.

Following through on the Administration's election-year small business crusade, Mr. Truman asked Congress to increase taxes on corporate income in excess of $50,000 and reduce levies on corporate income between $25,000 and $50,000. Congress is not likely to grant either of these requests.

Mentions Exemption Abuses

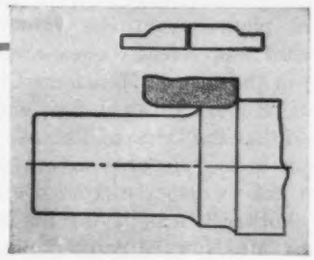
Under the category of plugging loopholes, he asked Congress to reduce "excessive" depletion allowances for the mining and oil industries. This made a host of legislators see red. Mining state Congressmen concerned about the shutting down of marginal mines, and oil staters worried about imports will make certain that this proposal never sees the light of day. It will be remembered that it was a provision for such allowances which several years ago caused Congress to override a veto of tax bill which President Roosevelt had termed "relief for the greedy and not the needy."

The President also referred to exemptions which have been abused by "educational and charitable organizations," but neglected to mention cooperatives and labor unions which also enjoy special privileges. In an election year, nothing of any consequence affecting these groups is likely.

His recommendations calling for extension of the loss carry-forward provisions from 2 to 5 years and for changes designed to stimulate investment abroad are in sort of a twilight zone and their chances for passage depend on how far Congress will go in writing a general

This Rounder—

SETS THE STAGE FOR LOWER COST of Grinding Axle Diameters and Radii



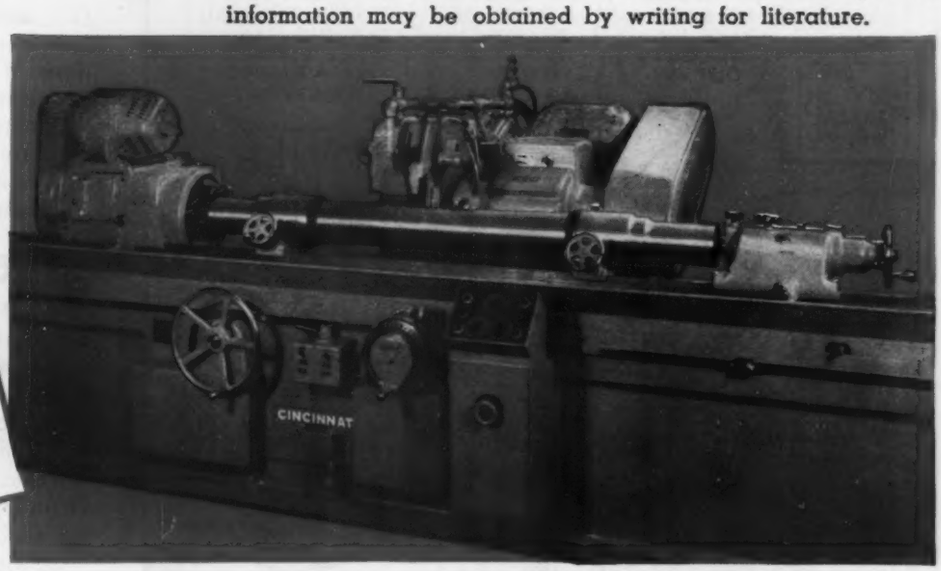
Left: Close-up of hydraulic profile grinding wheel truing attachment. *Right:* Drawing of profile cam and corresponding radius produced on wheel and work. Cams for this installation can be easily interchanged; cover a range of ¾", 1" and 1½" radii.

Long heavy work and several precision ground diameters with accurate sweeping radii are hard taskmasters for center type grinders. When these factors are combined in one part, such as the car wheel axles illustrated, extra good performance is required of the machine. CINCINNATI FILMATIC 14" and 16" Plain Grinders offer this extra value of performance, for the diameters and radii of the work can be precision ground in one setting. ¶ FILMATIC Grinding Wheel Spindle Bearings, well-proportioned castings for the principal units, and electronically controlled table traverse with automatic pressure way lubrication, contribute largely to the machine's dependable performance. Another feature—hydraulic profile wheel truing device—accurately rounds the corners of the wheels, one side or both sides, identical or different radii. This truing device accommodates several cams, corresponding to the radius desired for various sizes of axles. Two loading devices complete the equipment which makes CINCINNATI FILMATIC 14" and 16" Plain the most dependable and lowest cost axle grinders for your shop. More information may be obtained by writing for literature.

Close-up of ground diameters and radii on railroad car axle. One of the loading cradles is shown to advantage in this illustration.

FILMATIC

CINCINNATI FILMATIC 16" x120" Plain Grinding Machine with profile wheel truing equipment and loading cradles to facilitate grinding operations on railroad axles. Complete data in new catalog No. G-594.



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CENTER TYPE GRINDING MACHINES • CENTERLESS LAPPING MACHINES • CENTERLESS GRINDING MACHINES • MICRO-CENTRIC GRINDING MACHINES

tax bill. The odds are that excise taxes will be the main concern of Congress, tax-wise.

Defense Dept. Advocates Dispersal of New Plants

Large-scale movement of industrial plants from the vulnerable coastal and Great Lakes areas is not in the cards. Munitions Chairman, Hubert Howard, has emphasized that the Dept. of Defense program is to "disperse within areas and not to disperse from one area to another." Amplifying his statement, Mr. Howard pointed out that what defense officials advocate is the placing of new plants or new subsidiaries "at least 3 miles from existing plants in order that the effect of any one attack may be dispersed."

Some Congressmen, still not convinced, feel that the Dept. of Defense by strategic placement of orders might disrupt economic conditions in heavily - industrialized areas. Accordingly, Sen. Magnuson, D., Wash., has introduced legislation (S 2916) which would assure "adequate civilian participation in any military decisions" having to do with plant location. The measure would give the Munitions Board and the National Security Resources Board power to review military procurement plans and policies involving relocation of plants and the transfer of productive capacity from one plant to another in a different area as well as such transfers from private plants to government-owned facilities.

U. S. Steel Scheduled To Lead Off Monopoly Hearings

United States Steel Corp., fresh from its bout with The Joint Economic Committee, will within the next 2 weeks find itself before another Congressional committee to defend itself against claims of monopoly. Rep. Celler, D., N. Y., chairman of the monopoly subcommittee of the House Judiciary Committee, has announced that his study is now addressing itself to specific industries where alleged monopoly exists to supplement the exhaustive hearings of last year on the general subject of monopoly. Steel is scheduled to lead off on Feb. 15, 16 and 17.

Mr. Celler's investigation, which he hoped to inflate into another TNEC, has been faltering badly and he hasn't grabbed the hoped-for headlines. By dragging in big companies such as DuPont, Lever Bros., and U. S. Steel, he hopes to make a showing which might help to convince a skeptical and impatient Congress that it should accept his views and those of the Federal Trade Commission that bigness is illegal per se.

Insofar as the steel industry is concerned, Mr. Celler is apparently due for another setback, for it will be almost impossible for him to bring out anything new after the exhaustive and dreary hearings of the Joint Economic Committee.

Holding Hearings This Week

To present some evidence showing that all of his efforts have not been window-dressing, Mr. Celler is also holding hearings this week on three specific pieces of legislation: (1) H R 6679, to increase criminal penalties under the antitrust laws; (2) a bill to require the Justice Dept. to report to Congress on the nature, number and reasons for consent decrees and pleas of nolo contendre in antitrust cases; and, (3) amendments to the Webb-Pomerene export-trading statute. None of these measures have any strong support, no do they have any substantial opposition. Therefore, they are not likely to be approved by a Congress hoping for an early adjournment.

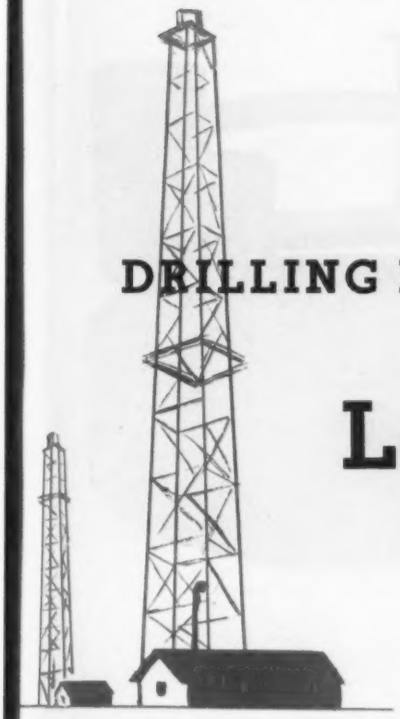
Limits Employment of Minors

Effective Jan. 25, minors under 16 are barred for the first time from employment in occupations in connection with transportation of persons and property, including pipeline; warehousing and storage; communications; public utilities; and construction, including demolition.

Off-site office and sales work is permitted for 3 hr a day, 18 hr a week when school is in session and the full 8-hr day, 40-hr week for vacation.

THE BULL OF THE WOODS By J. R. Williams

WELL, IT'S UP TO HIM-- HE SAID TAKE ALL TH' DENTS OUT OF IT!
THEY WON'T DARE TOSS ANY MORE GEARS ON THAT THING-- HE'S GOT IT AS THIN AS A ROOMIN' HOUSE SHEET NOW!
FIRST TIME TH' BULL LEANS ON IT IT'LL BE JUST ONE BIG SAG-- IT'LL LOOK LIKE A EMPTY FISH POOL!
2-3 J.R.WILLIAMS
THE FACE-LIFTING
COPR. 1950 BY NEA SERVICE, INC. T. M. REG. U. S. PAT. OFF.



DRILLING FOR OIL WITH

Large Precision Castings

New well drilling method uses big precision castings as rotor and stator to drive cutting bits. Technique permits use of lower quality drill pipe.

By K. J. Yonker and **J. F. Henderson**
Application Engineer — Die Designer
Allis-Chalmers Mfg. Co., Milwaukee

TWO of the largest and most difficult precision castings ever produced in the Allis-Chalmers' precision casting shop are the rotor and stator shown in fig. 1. These castings, which weigh respectively 8 and 12 lb as-cast, are components of a new type oilwell drill and illustrate a particularly interesting application of precision casting technique to a large part for severe service.

These two parts are used in the Turbodrill, a new drilling method perfected by the Engineering Development Co., Dallas, to overcome certain troublesome aspects of conventional drilling techniques.

Field trials of the Turbodrill have indicated several advantages over conventional rotary drilling, including less wear on the drilling rig, shaft and bit; faster drilling; and a straighter, cleaner hole.

In an effort to develop a more efficient and less troublesome drilling method, the Engineering Development Company of Dallas has designed a

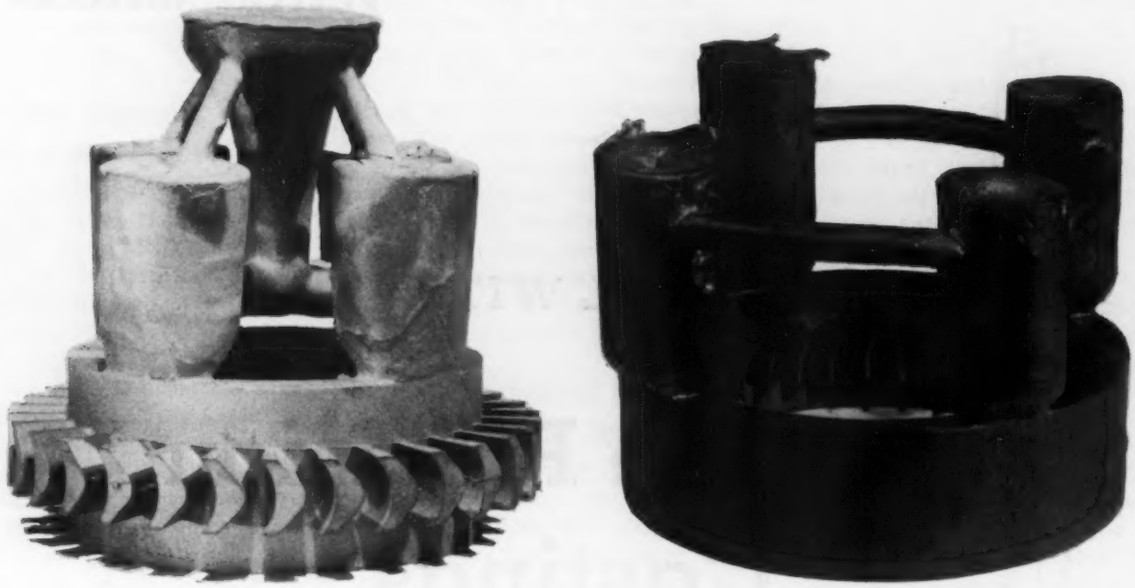


FIG. 1—Precision cast rotor (left) and stator for the Turbodrill. As-cast weights of these parts are 8 and 12 lb respectively.

turbodrill, which has successfully undergone several field trials. An analysis of the results of these trials indicates that turbine drilling is superior to conventional rotary drilling in several ways: Less wear on the drilling rig, shaft, and bit; faster drilling; and producing a straighter, cleaner, hole.

The advantages of the Turbodrill arise from the fact that power is not applied from the surface, but is developed at the cutting bit. Turning of the bit is accomplished by a hydraulic turbine using the drilling mud as a driving medium. The unit is made up on the end of the drilling shaft, with the cutting bit attached to the turbine rotor. A sketch of the Turbodrill is shown in fig. 2.

The turbine elements of each drill include 90 rotor disks, 89 intermediate stator disks, an input stator disk, and a final stator disk, all assembled into a 90-stage turbine unit. Each rotor disk contains 30 blades, and as-cast has a 7½ in. diam and a weight of 8 lb. Each stator disk has 29 blades, is 8½ in. diam and weighs 12 lb as-cast. The problem of finding a satisfactory and economical method of manufacturing, for each unit, 181 disks with a total of 5339 blades, was not an easy one.

The methods used for construction of similar disks, such as the steam-driven bucket wheels used to power emergency oil pumps for steam turbines, were considered. Such parts are frequently fabricated from individual blades, attached to hubs or rims by welding or by means of dovetail roots which fit into machined slots. The individual blades may be milled to shape, cast, or cut from rolled sections.

Another method for making bladed disks is to make up cast segments which can be welded together to form a complete wheel. Segments are poured in a sand mold in which a number of blades have been positioned so that when the molten metal enters the mold it will envelope the blade roots and form the required segment shape.

However, these methods, involving manufacture and assembly of individual pieces, would have been extremely expensive. Likewise, sand casting of complete disks would have proven overly expensive, since dimensional tolerances were such that finish machining would have been required on all surfaces, including the blades.

To get away from the cost of many machining operations, and yet to obtain satisfactory dimensional accuracy, precision casting offered an answer. Though parts of such size, weight, and shape, do not normally lend themselves to the precision casting process, Allis-Chalmers agreed to undertake development work and is now successfully producing castings in quantity.

An alloy was chosen for these parts which is resistant to abrasion, withstands high stresses, and has good casting properties with satisfactory physical properties obtainable by heat treating. Hardness of the parts as heat-treated for use runs about 300 Bhn.

The lost wax precision casting process, as used in the production of these parts, utilizes expendable patterns of wax which are attached to wax sprues. This assembly is positioned in a stain-

FIG. 3—Steel dies for the Turbodrill rotor pattern.

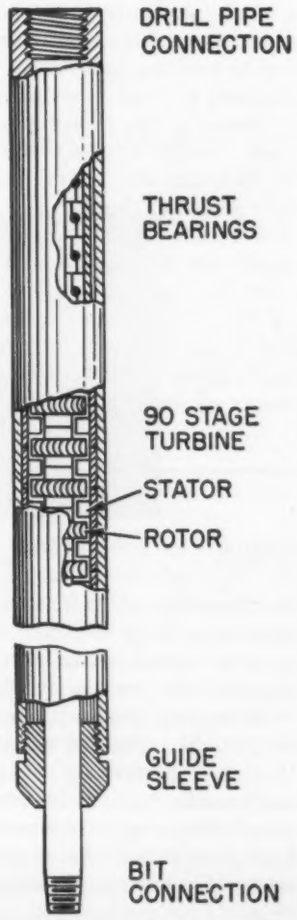


FIG. 2—Sketch shows location of the turbine in the Turbodrill.

less steel flask with the top, or pouring basin, of the sprue down. The investment material, with a consistency of wet cement, is poured into the flask, surrounding the pattern assembly. Within a short period of time, the investment hardens and the mold is then heated sufficiently to melt the wax, which runs out through the pouring basin. Thus a mold is obtained having no parting line and having an accurately-sized cavity.

The mold is fired before pouring, to vaporize any remaining wax and to cure the investment. This is done with a slowly increasing temperature to approximately 1800°F, at which point the mold is removed from the oven and poured off.

Two sets of large intricate dies (see fig. 3) were designed for the production of the wax patterns for the rotor and stator. Though dies have been made of such materials as stone, rubber, and cast soft metal, steel dies were decided upon because of their accuracy and resistance to wear. Both dies have retractable inserts to form the spaces between the blades.

The bottom plate of the rotor die contains 30 radial grooves which serve to correctly position these inserts. Each insert has a tongue on its bottom surface which engages the groove in the die so that when the insert is pulled away from the pattern, after injection, it will move radially. In the case of the stator die the inserts again have a tongue which engages grooves in the die. These grooves extend towards the center of the die so that after the wax has been injected and

the die opened, the 29 inserts are drawn toward the center of the die guided by the tongues and grooves.

When Allis-Chalmers was confronted with the problem of casting the rotor and stator for this unit, it was immediately apparent that shrinkage at the fillet between the blade and the hub or rim of the casting would be difficult to eliminate. This shrinkage problem was accentuated on the rotor disks since the individual blades are larger in cross-section at the tip of the blade than at the root. On the stator disk the individual blades are tapered so that the tip section is smaller than the root section. However, since the blades are on the inside of the rim progressive solidification was difficult to obtain and so shrinkage was also a problem on this part.

Although castings of this type are normally poured at relatively low temperatures to reduce shrinkage, in the case of these rotor and stator castings a high temperature was necessary to insure filling out the individual blades. Temperatures of about 2700°F for the rotors and 2900°F for the stators were found to be the lowest temperatures at which the castings could be poured and still have the thin edges of the blades full and sharp. Mold fill out is also influenced by the temperature of the invested mold prior to pouring, but it was decided not to vary this from the normal plant practice, in order not to interfere with production of other parts.

In making the stator castings a flask of special design was used to insure progressive solidification beginning at the tip of the blades. It is evident that if the stator were poured in an ordinary cylindrical flask there would be such a concentration of heat in the center of the mold that solidification could only proceed from the hub inwards, resulting in considerable shrinkage in the blade area. Therefore, a flask of donut shape was necessary, as shown in fig. 4.

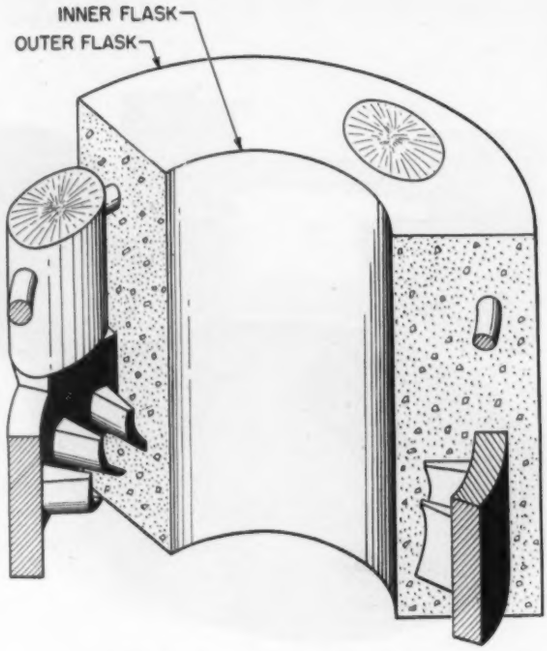


FIG. 4—Sectional view of the donut flask used in casting the stator.

Because of the large size of these molds, an extra-long curing cycle was necessary to insure complete volitalization of all wax trapped within the mold assembly. On both the rotors and stators, it was found necessary to use very heavy risers to feed the heavy hubs. Powdered graphite was added to these risers immediately after pouring, lowering the freezing point by raising the carbon content of the metal in the risers, and thus keeping the risers fluid and open for a longer period of time.

The rotors and stators have stood up exceptionally well during the field tests performed so far on the Turbodrill. During a recent test, a total of 7,000,000 lb of drilling mud, containing about 4 pct sand, was pumped through the turbine in 20 hr. The turbine elements showed no evidence of undue wear from this test.

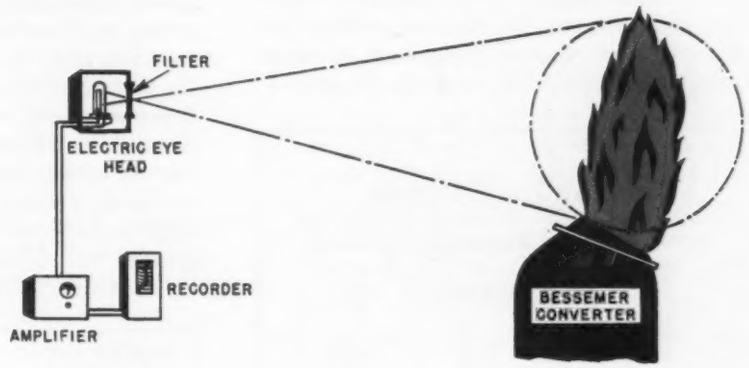
NEW BOOKS

"Punches and Dies," by F. A. Stanley. Each phase of modern punch and die work is covered in this fourth edition of the guide. Practical fundamentals, layouts, construction and various uses for specific work are described, and information on development of die design, use of metal stampings for complicated constructions where expensive forgings or castings were formerly used, sectional dies and big press work is included. McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 18. $4.75. 583 p.

"Safe Handling of Radioactive Isotopes." Handbook gives general safety recommendations to protect scientists and technicians conducting research on radioactive isotopes, industrial workers handling such materials, and the general public. Specific problems discussed are those of personnel, laboratory design and equipment, hazard instrumentation, hazard monitoring, and transportation of isotopes. U. S. Government Printing Office, Superintendent of Documents, Washington 25, D. C. 15¢. 29 p.

FOR BETTER MACHINABILITY-

E STEEL



New free machining steel gives up to 25 pct faster metal removal—
200 pct increase in tool life—plus a good surface.

By F. T. KENT
Metallurgist, Jones & Laughlin Steel Corp., Pittsburgh

A NEW free machining steel that can be machined 10 to 25 pct faster than the fastest standard free-machining bessemer screw steel was announced recently by Jones & Laughlin Steel Corp. In addition, the new E steel claims a smoother finish after machining, better cold working and cold forming properties, and longer tool life on screw machines than the conventional bessemer grades of steel.

Previous developments of free machining bessemer screw steels were mostly on the basis of additions to the basic quality. To a varying extent some additions of carbon, manganese, phosphorus, sulphur, and lead contents have been tried and appraised. Except for some very limited applications, carbon additions were found to be negative.

Manganese additions, though found beneficial to surface quality, were negative as to machining quality. Phosphorus additions were slightly helpful to machining, but aggravated a tendency toward greater breakage in the grade. Leaded steels had very good machining characteristics. Applications were limited, however, by high costs resulting from a deleterious effect upon bar surface quality and a health hazard when producing and fabricating leaded steels.

In the meantime a struggle against cracks and seams on semi-finished steel and hot rolled bars due to red shortness characteristics imparted to steel by sulfur has been going on in the steel mills. With all the quality control that can be mustered by steelmakers, advancing sulfur contents have made the manufacture of high sulfur grades a problem from the standpoint of extra conditioning and rejection costs which are necessary to maintain acceptable surface quality.

In E steel, instead of adding to the basic composition, carbon was decreased to one-half the normal content. In the new steel a medium carbon ferromanganese containing only about 1.30 pct C is used as a deoxidizer instead of the standard 6.70 pct C ferromanganese. Average analysis of the two alloys is given in table I.

TABLE I

Comparative Analyses

	Average Chemical Composition, Pct	
	Medium Carbon	Standard
Carbon	1.30	6.70
Manganese	83.00	80.00
Phosphorous	0.28	0.27
Sulfur	0.005	0.005
Silicon	1.30	0.75
Iron	14.00	12.00

Conventional bessemer screw steel to which standard ferromanganese has been added reacts violently in the ladle due to the evolution of gases, and requires some further deoxidization on teeming. The new steel, utilizing medium carbon ferromanganese, is relatively dead and rarely requires any mold addition. Theoretically, the relative absence of gas evolution from the new steel produces a more homogeneous dispersion of inclusions and thereby benefits machinability.

Gas bubbles passing up through the molten metal have a washing effect on the liquid which tends to agglomerate inclusion matter and carry it toward the top center of the ingot. Absence of turbulence in the liquid steel also keeps inclusion forming constituents in solution at lower temperatures to further prevent segregation. Thus, in conventional bessemer screw steel practice, inclusion forming matter is segregated due to bubble action in the ladle and molds. In the new steel, many inclusions beneficial to machinability, such as the various combinations of oxygen with manganese, sulfur, and iron, are retained to a greater degree in their state of formation—submicroscopic in size and finely dispersed throughout the metal.

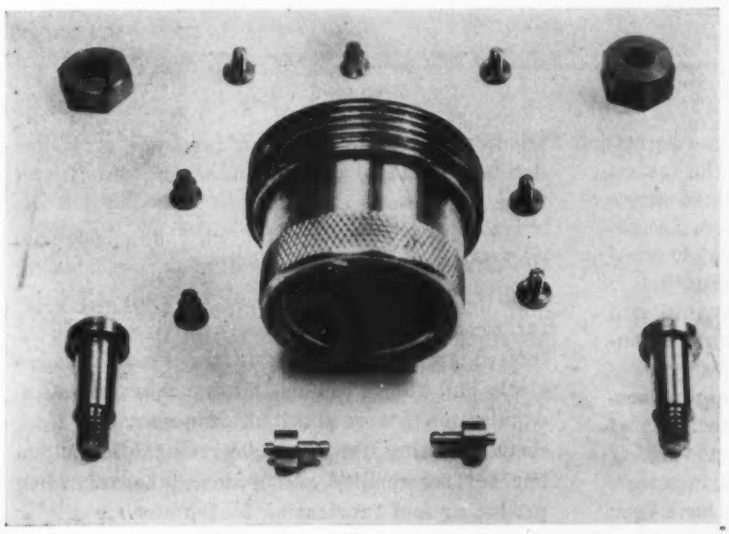
The new steel is produced in each of the grades shown in table II. With the exception of carbon, the limits and ranges for the respective chemical elements shown are the same as for conventional AISI grades B-1111, B-1112, and B-1113. Carbon ranges 0.04 to 0.06 pct in E steel whereas 0.08 to 0.13 pct is the range for conventional grades. However, both carbon ranges are within the standard AISI specification of 0.13 pct max C for acid bessemer resulphurized carbon steels.

TABLE II

Chemical Limits

No.	C, max	Mn	P	S
E-15	0.06	0.60 to 0.90	0.07 to 0.12	0.08 to 0.15
E-23	0.06	0.70 to 1.0	0.07 to 0.12	0.16 to 0.23
E-33	0.06	0.70 to 1.0	0.07 to 0.12	0.24 to 0.33

Machinability refers to the ease with which steel may be cut to produce a satisfactory part. However, it has been found that machinability is a very elusive quality and difficult to evaluate



Typical parts machined from E-steel cold-finished bars. Over 6100 tons of E steel were field tested in 45 machine shops, who reported increased production through its use.

due to variables in both steelmaking and machining conditions. Uniformity, degree of oxidization in steelmaking, composition, type and dispersion of inclusions, size and section of bars, percent cold reduction and physical properties all have some effect.

Variables introduced in machining include type of cutting, shape and size of part, production rate, tool properties and design, standard of surface finish maintained, machine, and cutting fluid. Thus, the measuring stick can only be applied after normal variables have had an opportunity to aid, detract from or otherwise alter performance of the particular design being studied. Therefore, testing, to be reliable, must be extensive.

Machinability evaluation of the new steel was done largely by production machining on automatic screw machines. During the development stage, over 6100 tons of E steel were supplied to forty-five independent machine shops for actual field tests. Cold finished bar stock furnished ranged from ¼ to 3⅝ in. in both round and hexagon sections. When these tests clearly demonstrated the superior machining characteristics of the new steel, it was released for production applications and subsequent performance has confirmed the excellent results obtained during the testing program.

Experience with one experimental lot, consisting of three E-33 heats and three B-1113 heats, is cited as typical of the results reported by the various fabricators. Chemical composition and machining performance are shown in table III.

These steels were machined on six spindle automatic screw machines under standardized operating condition for regularly producing a single part; and results were based upon the standard of regular performance of conventional bessemer screw steel. Machining operations included drilling, forming and cut off, with approximately 65 pct of the metal being removed. The new steel was described as being superior to any material previously used in this plant. Finish on the part was reported as excellent.

Machinability ratings, based on B-1112 as 100 pct, have been generally accepted as a means for comparing the free cutting quality of steel.

Turn to Page 96

TABLE IV

Cutting Speeds

Relative Speed Assuming B-1112 Is 100 Pct

E Steels, Pct	Conventional Steels, Pct
E-15, 110	B-1111, 90
E-23, 125	B-1112, 100
E-33, 170	B-1113, 135

TABLE III

Chemical Composition

	E-33			B-1113		
Heat	A	B	C	D	E	F
Carbon	0.05	0.06	0.05	0.10	0.10	0.11
Manganese	0.99	0.89	0.83	0.83	0.85	0.85
Phosphorous	0.094	0.099	0.095	0.099	0.096	0.106
Sulfur	0.289	0.301	0.304	0.310	0.310	0.315
Machining Performance Tool Life, hr	8-10	12-15	8-10	3-4	2-3	2-3

TABLE V

Mechanical Properties*

Material	Yield Point, psi (000 omitted)	Tensile Strength, psi (000 omitted)	Elong., Pct in 2 in.	Reduction of Area, Pct
E-33				
Hot rolled	33-43	59-67	27-38	50-60
Cold-finished	63-76	73-85	16-20	40-50
B-1113				
Hot-rolled	35-46	61-70	25-30	45-55
Cold-finished	65-80	75-90	10-20	40-50

* Values given are for a 1-in. round.

Shops where E steel was field tested have reported increases in tool life as high as 200 pct, using the new material in manufacture of a wide variety of parts on such modern six-spindle automatic screw machines as the one shown here.

STEEL SHOT SPEEDS } Blast Cleaning Shot Peening

Newly developed cast steel shot causes less wear on equipment, lasts longer and eliminates some pickling. Advantages said to offset premium over chilled iron cost.

By L. J. Wieschhaus
Market Research Engineer,
American Wheelabrator & Equipment Corp.
Mishawaka, Ind.

FIG. 1—Shot breakdown tester used in laboratory tests to determine relative breakdown rates of various types of shot. A measured quantity of shot is being poured into the machine.

THE recent development of cast steel shot gives promise of being the most important advance in blast cleaning and shot peening operations in the past decade.

Since the first sand blast machine was built, there has been a continuing search for ways of improving the economy and performance of blast cleaning equipment. These efforts have followed several lines: (1) Producing more wear-resistant materials for use in the equipment; (2) controlling the blast stream so that as much of its energy as possible is spent on the work to be cleaned and, (3) developing a cleaning material that would have longer life and cause less wear on the equipment without sacrificing anything in cleaning efficiency. The development of cast steel shot falls in this third group.

Probably the most important early advance in abrasives for blast cleaning was the development of cast iron abrasive to replace the sand and other non-metallic materials previously used. Although the use of cast iron shot and grit instead of sand brought about a great improvement in abrasive breakdown and in equipment wear, there were still certain disadvantages inherent to the material.

In order to improve this situation, abrasive producers worked out heat treating and annealing methods. The purpose of these treatments being to soften or alter the material sufficiently to reduce the breakdown rate of the shot and the wear on the equipment without affecting the cleaning rate of the abrasive. This heat treatment helped, but it was felt that the most desirable material would be a true steel—hard enough to do the necessary cleaning job and yet tough enough to provide maximum resistance to shot breakage and minimum wear on the equipment.

The principal difficulty lay in developing an economical method of casting steel shot and heat

treating it in the quantities needed and with close control of the size and quality of the material produced. After several years of research and development work, these problems were finally worked out and a cast steel shot that had received a full heat treatment was made available for test purposes. More than a full year of laboratory and field tests have now provided the necessary data for evaluating the usefulness of steel shot. These tests have demonstrated that cast steel shot would produce results not obtainable with other abrasives.

Tru-Steel Shot, a cast steel product manufactured by Steel Shot Producers, Inc., Butler, Pa., is produced directly from molten steel in one operation by an exclusive process. Starting with the raw materials normally used in producing electric furnace steels, a triplexing operation is used which controls the chemical analysis and temperature of the molten metal and produces shot that is round and tough. The hardness and metallurgical structure required for the ideal balance between long shot life, reduced equipment wear and optimum cleaning or peening ability, is obtained by means of a closely controlled heat treating cycle involving a quench and draw.

The true measure of the value of any shot lies in the way it performs under operating conditions. The first comparative tests between steel and chilled iron were run in the laboratory, under carefully controlled conditions, in a shot breakdown tester similar to that shown in fig. 1. In this machine a small bladed wheel hurls the shot against a target designed so that the shot strikes the surface at what is substantially a right angle, thus undergoing the maximum possible impact for a given mass and velocity. After striking the target the shot drops into a cup below the discharge spout.

The shot is passed repeatedly through the wheel and is screened periodically to determine the breakdown rate. This data is then usually reported in terms of number of passes through the wheel for average life. Fig. 2 are photomicrographs of typical samples of steel shot and chilled iron shot taken at various intervals during a test in the shot breakdown tester.

On this basis, steel shot demonstrated its superiority over the cast iron variety. It was realized, however, that these laboratory tests could not be accepted quantitatively as a measure of the relative value of the two materials since the ideal conditions prevailing in the laboratory are seldom encountered in the field.

With the laboratory evidence of the long life characteristics of the steel shot at hand it was felt that the material was ready for field tests. The purpose of these field tests was to determine (1) how well it cleaned, (2) what its life was under actual operating conditions, (3) what effect it had on equipment wear and (4) what

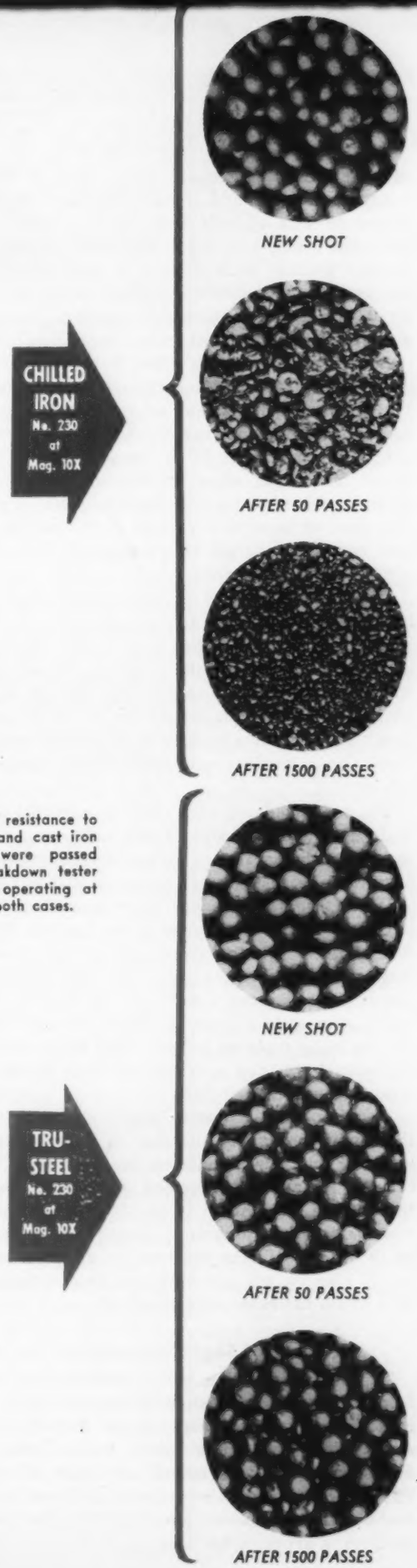


FIG. 2—Comparison of resistance to fracture of cast steel and cast iron shot. Both samples were passed through the same breakdown tester with the blade wheel operating at the same speed in both cases.

effect it had on subsequent finishing operations.

After some trial and error, a standardized test procedure was adopted that would provide reliable and comparable data. Provision was made for the gradual introduction of steel shot into the system so that the machine would, at all times, be charged with conditioned shot. It was discovered that, in most cases, steel shot gave its best cleaning results after it has been conditioned by 3 or 4 hr of operation in the machine. It was this discovery that led to the practice of adding the steel shot gradually so that no marked change in appearance of the work occurred. The actual test began when all of the chilled iron in the machine had been replaced by steel. From that time on records were kept of the pounds of shot added, the wheel hours operated, and the amount of work cleaned.

The first question to be answered by the field test was whether steel shot would clean as well as the chilled iron. When conditioned shot was used it was found that the cleaning rate of steel was usually somewhat faster than that of chilled iron. This is due, primarily, to steel's tendency to wear down instead of fracturing, which results in a larger average size in the working mixture.

The magnitude of this effect is variable and is dependent on the size of shot deliberately removed by the separator, as well as the quantity of usable shot lost through carry out and leakage.

If the separator is set to remove shot just slightly smaller than new, there can be little difference in average size regardless of breakdown characteristics. Conversely, with the separator set to remove a relatively small size, and if the rate of loss is great enough so that steel shot is being replaced before it has much chance to wear down, the average size will be much larger than with cast iron.

Cleaning effectiveness is largely dependent on the kinetic energy in the shot as it strikes the work. From this standpoint the steel shot, because of its larger average size, frequently cleans faster than the chilled iron. If the separator were maintained to keep a larger average size of chilled iron in the machine its cleaning rate would also go up, although abrasive consumption would increase correspondingly.

Effect of Shot Consumption

The second question to be answered by the field tests was the question of the average life, in the machine, of steel versus chilled iron. Actual shot consumption varies widely between different installations and is seriously affected by carry-out, leakage from the machine and separator setting. An example of a severe carry-out problem is given in fig. 3.

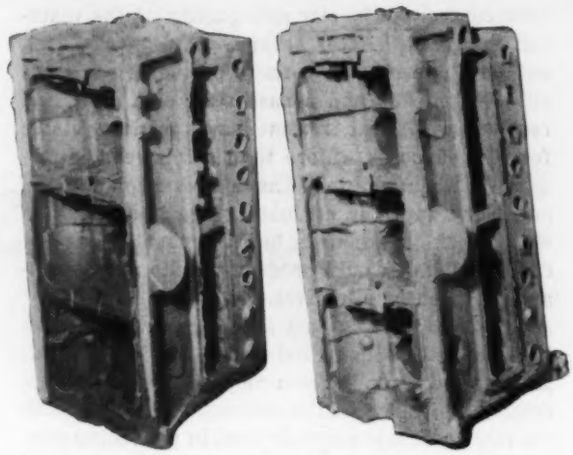


FIG. 3—Cylinder blocks before and after cleaning in a blast cabinet. This type of casting presents a serious shot carry-out problem. Special precautions must be taken to assure recovery of shot carried out of the blasting equipment.

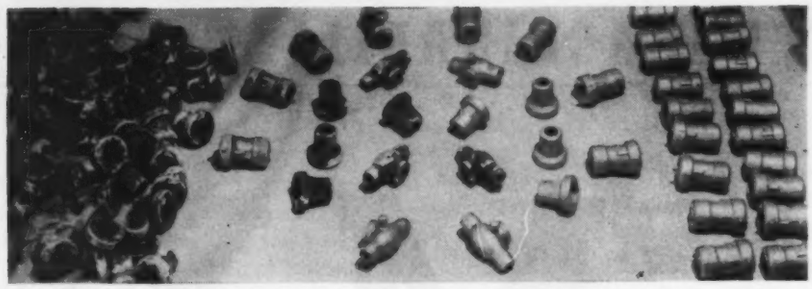
For example: Assume a machine operating on chilled iron abrasive was using 30 lb of abrasive per hour, of which 25 lb were being broken down and 5 lb were being carried out of the machine. If steel shot were used, suppose the breakdown rate were only 0.5 lb per hr. The carry-out would remain at 5 lb per hr, thus giving a total shot consumption of 5.5 lb per hr or approximately 5.5 to 1 life ratio, when compared with chilled iron.

If the carry-out were reduced to 1 lb per hr, the chilled iron consumption would have dropped to 26 lb per hr, while the steel consumption would go down to 1.5 lb per hr for a life ratio of approximately 17 to 1. If carry-out were completely eliminated, the figures would be 25 lb of chilled iron compared to 0.5 lb of steel for a ratio of 50 to 1. In many cases the shot lost through carry-out and leakage may be considerably in excess of the 5 lb figure used in this example.

Under a given set of operating conditions it is this ratio of apparent consumption that is one of the determining factors in measuring the value of steel shot. Accurate records were kept on abrasive consumption for both chilled iron and Tru-Steel for a period covering several months of operation. A few of these results are given here to illustrate the type of savings resulting from the use of steel shot.

In a Tumblast machine used for cleaning alloy steel forgings after annealing and after heat treatment for plating, it was found that steel shot lasted 5 to 6 times as long as the ordinary chilled iron. The steel shot consumption was approximately 2¾ lb per wheel hr as compared to 15 or 16 lb of chilled iron.

Malleable iron castings being cleaned in a



When cleaning these pipe fittings, work is tumbled short time after abrasive blast is shut off to lessen shot carry-out.

48x42 in. machine showed an abrasive consumption with chilled iron of 23.8 lb per wheel hr as compared to 8.02 lb of steel.

A Wheelabrator special cabinet used for cleaning and peening loom rollers had the separator set so that everything smaller than whole size shot was immediately removed from the system. This was essential in this operation because of the peening effect desired. When using chilled iron shot, 600 lb of shot were consumed in peening 1000 rollers; with steel only 61.5 lb were used per 1000 rollers.

Effect on Equipment Wear

It was known that the steel shot would cause much less wear on the equipment than did chilled iron, but the field tests were also of value in helping to establish the importance of other factors, such as a heavy sand load. The field tests bore out the fact that the steel shot, itself, causes very little wear on the equipment and, in those cases where sand is kept out of the circulating shot, important savings in maintenance costs were effected. Conversely, where heavy sand loads were being circulated with the shot, little or no improvement in the life of wearables was noted.

In an application removing heat treat scale from forged wrenches, the usual life of the blades in the cleaning unit was ten days to two weeks when chilled iron shot was being used. During the test with steel shot no wheel parts, blades, control cages or impellers, were replaced during the entire 476 hr of the test run.

In another application involving the cleaning of steel castings, steel shot resulted in a saving of 73 pct on wearable parts and 80 pct on maintenance labor. Although appreciable quantities of sand were being removed from these castings, the abrasive separator was properly adjusted to keep the bulk of the sand out of the circulating shot load.

In still another case, a steel shot test was conducted in a machine being used for cleaning gray iron castings for agricultural implements. The ventilation on this equipment was very poor and large quantities of sand were being circulated in the system. The result was a blade life of less than 20 hr, which was no improvement over the results obtained with other types of abrasive.

The abrasive action of sand is so severe that, when it is present in any quantities, its effect almost completely overrides that of any other metallic shot or grit that may be in the system.

Effect on Part Finish

The effect of the steel shot upon subsequent finishing operations was carefully observed. Steel shot imparts a dull lustre to the surface and gives the part an almost polished appearance. Although chemically clean, this is a somewhat different finish than that produced by chilled iron, and there was considerable speculation as to how this change would affect the plating or coating characteristics of the surface.

In a test on pole line hardware consisting of castings and forgings of either brass or iron, it was found that the parts galvanized satisfactorily directly after cleaning with steel shot and no acid rinse was required.

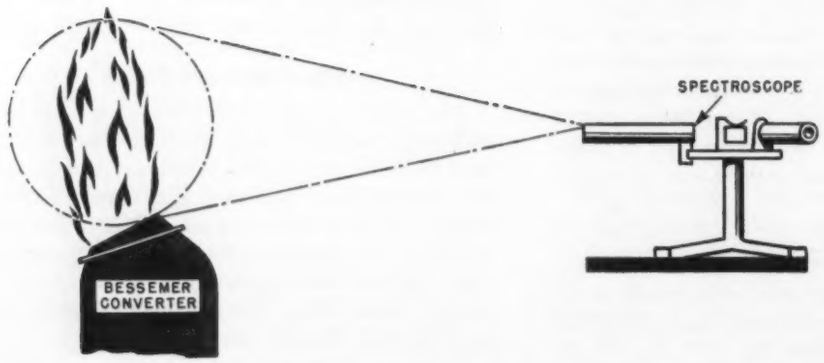
Preliminary tests involving the cleaning of hot rolled strip prior to cold rolling and tin plating indicated that the use of steel shot would make it possible to completely eliminate the pickle rinse normally used when chilled iron or malleableized iron abrasives were used. Experience with iron abrasive indicated that sharp corners would occasionally imbed in the strip and, unless removed by a pickle bath, would cause rejects in the tin plate mill. The steel shot caused no trouble from the standpoint of imbedding abrasive and at the same time thoroughly cleaned the strip for further operation.

The overall results of these tests have been to demonstrate conclusively that steel shot offers very real savings from the standpoint both of abrasive cost and maintenance cost if the equipment is properly operated.

Because this is a premium product selling at a higher price than chilled iron it is important that the fullest use be made of the advantages it offers. Excessive carry-out or leakage cannot be tolerated. By the same token, excessive sand in the abrasive system nullifies the advantages offered from a maintenance standpoint. However, both of these conditions represent inefficient operation and should be corrected regardless of the type of shot used.

BETTER MACHINABILITY WITH-

MX STEEL



Close control of chemistry in this more machinable steel opens new production horizons.

Machines 45 pct better than B 1113

By A. W. MacLAREN and L. W. OSWALD

Asst. Metallurgical Engineer and Staff Metallurgist, Carbon Bar and Semifinished Unit, Carnegie-Illinois Steel Corp.

WHILE the term "machinability" has been widely and glibly used there has never been a single definition of the word universally acceptable to the metalworking industry. The factors affecting the removal of metal by cutting tools have been studied widely, and machine shops, machine tool builders, coolant suppliers, and steel producers have contributed to the effort.

A tangible definition of improved machinability, insofar as a steel producer is concerned, is an acceptance of a new steel which gives increased production on automatic screw machines. Such acceptance of a new free machining steel, introduced by Carnegie-Illinois Steel Corp., may be considered to concur with the definition of machinability presented by H. B. Knowlton[1]: "The most machinable steel is the one which will permit the fastest removal of the greatest amount of material (before resharpening the tool) with a satisfactory finish."

Carnegie-Illinois MX* steel is a bessemer product made within the chemical composition limits of AISI B-1113. The steel is yielding remarkably improved performance in automatic screw machines. Controlled melt-shop practices are responsible for the excellent machinability results

*Covered by U. S. Patent 2,485,358.

currently being reported by users. Refinements in the mode of operation in the bessemer shop have been made through the use of the spectroscope by Carnegie-Illinois. This instrument permits accurate and consistant determination of the end point of the blow.

Melting of MX steel represents the application of still further control of practice. The methods being used were developed in the bessemer shops as an outgrowth of research at Battelle Memorial Institute sponsored by the research and development department of Carnegie-Illinois Steel Corp.

The principal factors considered to be responsible for improved machinability are: (1) carbon level, (2) silicon level, (3) manganese level, (4) nature of the sulfide inclusions, and (5) control checking of the product.

Ordinarily the carbon level of regular B-1113 steels lies in the range of 0.10 to 0.13 pct. The early experimental work on machinability at Battelle showed the value of lower carbon levels. Therefore MX is usually made to 0.08 pct C max. This results in increased cost of production, as low carbon ferromanganese must be used to meet the manganese specification. A few specific requirements involving minimum mechanical properties in the finished product are under investigation. These may eventually result in slightly higher carbon specifications in the MX grade. Higher carbon contents will offer higher mechanical properties but at some loss in machinability.

Silicon Level a Major Factor

Silicon level has been found to be of major importance in bringing about improved machinability in the low carbon bessemer screw steels. In view of this fact, current practices on MX steels are set up on the basis of working to a limiting maximum silicon specification. The control of this feature of the production of these steels is the subject of continuing plant study, for such control is considered to be a major factor.

It has been found advisable to maintain the manganese level of the MX steels well within the 0.70 to 1.00 pct range of the B-1113 analysis. This tends to increase production costs, for large amounts of low carbon ferromanganese must be used. The manganese effect was found to be markedly less than the carbon effect in altering machinability indices on test lathes devised for Carneigie-Illinois at Battelle Memorial Institute and described by Boulger[2].

Method Controls Sulfides

As a result of work completed to date it is apparent that the nature of the sulfide inclusions is a most potent factor in controlling machinability characteristics. Melting practices calculated to yield globular sulfides are used in making MX. Work is currently being done to improve the practices which are considered to be necessary to control this feature of sulfide size and shape.

Practices have been established on MX steels that allow control checking of the bar product prior to shipment from the rolling mills. This has been done for the dual purpose of maintaining uniformity of performance in the trade and of allowing for the continuation of research. Each blow of MX steel is arbitrarily tested on machinability lathes and subjected to a number of acceptance tests. These tests determine whether the particular heat conforms to the standards established for these steels.

That these practices are justified is being affirmed in the trade. Automatic screw machine operators, using cold drawn bars, are reporting excellent performance on the MX steels. Minor changes in machining practice have corrected the few situations where initial difficulty was reported. An increase in speed has been found to serve the purpose in most cases.

Fine Results Reported

Typical of the results that have been obtained are included in several short case histories.

One machine shop, using 7/16 in. cold drawn hexagons in a model B, 9/16 in. Davenport automatic screw machine, has standardized on a 33 pct greater output when using MX steel, rather than regular B-1113, on automotive grease fit-

These photos point up the cold working properties of MX steels. The MX drum nut is intact after a curling operation while a nut of regular B-1113 steel shows cracking usually expected in this application.

tings. Surface finish at this output has been better on the MX parts.

In early trials, when speeds were increased to some 20 pct over normal for regular B-1113, the tool life increased 41 pct. When the operating speeds were increased to such an extent as to yield a 45 pct increase in output, the tool life obtained was the same as that normally obtained before trials of MX steel were started.

In producing drum nuts on a 4-spindle R Acme-Gridley automatic, using $\frac{5}{8}$ in. cold drawn rounds, 96 pct greater tool life was obtained on MX over regular B-1113 steel. Machining speed in this case was increased from 285 to 345 sfpm. The cycle time on the part was cut from 3.17 sec to 2.86 sec, and much-improved surface resulted.

Beveled washers, when made from MX steel on a Brown & Sharpe G 2-0 automatic by one producer at increased speeds of approximately 15 pct, showed a 29 pct production increase over that for regular B-1113. Tool life, at the same time, increased some 20 pct. The actual speed increase was from 235 to 270 sfpm.

While the performance in machine shops is the ultimate criterion in the eyes of the consumer, comparative machinability indices of the two types of steel, as determined on test lathes, are of interest. Test results have shown the average machinability index for regular B-1113 heats to be of the order of 138, in comparison with B-1111 hot-rolled as the base index of 100. Individual indices have ranged from 115 to 160. MX heats have been found to have an average index of the order of 200, with the range of indices being from 170 to 240 on tests made to date.

The cold workability of the MX steels is worthy of mention, for it has been demonstrated that the new steel performs more satisfactorily than B-1113 steel in crimping and curling operations performed on machined parts. The characteristics of the two types of steel are demonstrated clearly in figs. 1 and 2, which show drum nuts curled into drum heads.

References

[1] "Machinability of Ingot Iron, Wrought Iron, SAE Steels, and Stainless Steels," Machining of Metals, ASM, 1938, p. 35.

[2] "Constant Pressure Lathe Test For Measuring the Machinability of Free-Cutting Steels," by F. W. Boulger, H. L. Shaw and H. E. Johnson, Transactions ASME, July, 1949, p. 431. See also "Measuring Machinability," THE IRON AGE, Jan. 19, 1950, p. 68.

Physical Properties of Ductile Zirconium

AMONG current investigations of the physical properties of ductile zirconium produced by reduction of zirconium chloride with magnesium is that conducted by E. T. Hayes, E. D. Dilling and A. H. Roberson, Northwest Electro-Development Laboratory, Bureau of Mines. Their work, described in a paper presented at the recent ASM annual meeting, dealt primarily with optimum annealing conditions of cold-worked zirconium sheet, hardness and tensile properties, and microstructures of the working steps involved.

Zirconium metal was forged and rolled at 1560°F to satisfactory sheet and rod by protecting the metal from oxidation with an iron sheath. It was found that satisfactory sheet could also be produced by hot rolling the forged ingot at 1200°F in air.

Tensile strength of the sheet rolled at 1560°F was increased by cold rolling from 63,500 psi to 93,500 psi by 60 pct cold reduction without evidence of overworking. Hardness rose from RB 86 to RB 98, with over 70 pct of the work hardening occurring during the first 20 pct of cold reduction. Percentage of elongation dropped from an initial 14 to 8.5 at 20 pct cold work, and then remained constant to 60 pct cold work.

The sheet prepared by rolling at 1200°F was annealed, which caused the tensile strength to drop from 86,400 to 80,000 psi at 750°F, and to 59,000 psi at 1290°F. Temperatures up to 2010°F did not materially lessen this value. Complete stress relief occurred at 930°F, with recrystallization complete at 1110°F. Grain growth was rather slow, increasing from 0.015 mm at 1290°F to 0.040 mm at 2010°F. Yield point values decreased from 64,400 psi at 750°F to 33,800 psi at 1470°F, and then increased to 40,500 psi at 2010°F. Elongation increased from 9 pct in the cold-worked material to 14 pct at 750°F, 27.5 pct at 1290°F and 29 pct at 2010°F. Annealing for 1 hr in an inert atmosphere appeared to give a satisfactory anneal for 50 pct cold-reduced zirconium sheet.

Material rolled in air at 1200°F before cold rolling had tensile properties similar to those obtained on the sheet rolled at 1650°F, the major difference being a 2 pct increase in elongation for the 1200°F sheet. Tensile strength of zirconium sheet was determined at —360°F, and showed a 58 pct increase over the values found at room temperature. Elongation dropped from 9 pct to 6.2 pct. Impact values dropped from 17.5 ft-lb at —360°F to 16 ft-lb at room temperature and 390°F, and then rose to 28 ft-lb at 1110°F. Hardness values for rolled plate varied from 217 Bhn at —360°F to Bhn 25 at 1110°F.

Radioactive Tracers

USED TO STUDY PLATING PROCESS

A BETTER understanding of the mechanism of electrodeposition in chromium plating is seen resulting from recent studies by E. Ogburn and A. Brenner, National Bureau of Standards, using radioactive tracer techniques.

By tagging either the trivalent or the hexavalent chromium ion in a chromic acid plating bath with radioactive chromium 51, it was shown that metallic chromium is deposited out of the bath from the hexavalent state rather than from the trivalent state, as had previously been suggested. In addition to solving a long-standing problem in electrochemistry, the Bureau's work has demonstrated the utility of tracer methods as a tool for research on industrial plating processes.

Five chromic acid plating baths were prepared, and a small quantity of radioactive trivalent chromium was added to two of the baths as chromic chloride while hexavalent chromium was added to the other three baths as radioactive chromic acid anhydride.

Chromium deposited from the first two baths was inactive. On the other hand, deposits from the baths in which the hexavalent chromium was tagged were found to be radioactive, and their activities were close to those of deposits from a bath containing active hexavalent chromium and no trivalent chromium. It was thus evident that the metal is deposited from the hexavalent rather than the trivalent state.

Isotopic exchange frequently takes place between different valence states of the same metal. Had it occurred in the investigation to any appreciable extent, it would have resulted in the presence of sizable quantities of both active trivalent and active hexavalent chromium in the plating bath, regardless of which was added.

It was therefore necessary, before performing the experiment, to determine the extent to which isotopic exchange takes place between trivalent chromium and chromic acid in the plating bath.

A stock solution containing both trivalent and hexavalent inactive chromium ions in fixed proportions was divided into two parts. To one part, active hexavalent chromium was added as chromic acid; to the other, active trivalent chromium was added as chromium chloride. These solutions were kept at 122°F for one hr, and at intervals 5-ml samples were taken from each solution. The hexavalent and trivalent chromium in each sample were separated chemically, and the activity of each fraction was measured. The activities of the two fractions of each sample showed that at the end of an hour a small portion of the tracer had undergone an isotopic exchange, but not enough to interfere with the investigation.

Electrolytic Polishing of Copper

DEVELOPMENT of a new process for electrolytic polishing in Belgium by M. Jaroszewicz-Bortnowski and J. Schoofs, described recently in the *Engineer's Digest*, London, overcomes the long polishing time and careful specimen preparation usually required for copper by oscillating the specimen in the electrolytic bath.

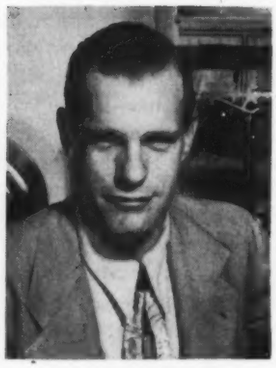
The specimen (anode) is mounted in a phosphoric acid bath, 50°Be, so that the surface to be polished extends vertically. During polishing, the specimen is oscillated in a direction normal to the surface, the length of stroke being 2⅜ in. and the mean distance from surface to cathode 3⅛ in. Oscillations parallel to the surface, at constant distance from the cathode, did not prove equally successful. Since the movement tends to destroy the anodic layer required for polishing, the terminal voltage must be increased.

Best results were obtained with 4 to 5 v, depending upon the mean position of the specimen with respect to the cathode, for a frequency of one full stroke (back and forth) per sec, and with 9 to 10 v for two full strokes per sec. The latter speed results in splashing of acid, and is therefore only used in special cases. Current is switched on for only 5 min if the specimen has been prepared with No. 00 emery paper.

This method was found to give excellent results for the polishing of electrolytic, phosphoric and arsenical copper, 5 pct Mn-Cu, 0.2 to 1 pct Cd-Cu, brasses with 59 to 95 pct Cu, bronzes with 0.25 to 8 pct Sn, silicon bronzes, and copper-nickel-zinc alloys of various compositions. Cupronickels (80/20, 75/25, 70/30) should be polished for 10 min in a bath of 90 pct by volume phosphoric acid, 50°Be, and 10 pct by volume sulfuric (60°Be) acid. In some cases, such as with 60/40 brass, a strong polishing action, 10 min at 9 to 10 v with 2 full strokes per sec, dissolves the skin metal so that correct micrographs are obtained without emery preparation.

NORTHROP DEVELOPS

New Aluminum Primer



By K. B. NILES
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Northrop Aircraft, Inc.
Hawthorne, Calif.

Synthetic resin gives more corrosion protection of aluminum and magnesium. Seal primer also improves appearance and furnishes better lacquer base than zinc chromate.

AN improved type of seal primer for aluminum aircraft parts, developed recently by Northrop Aircraft, Inc., has demonstrated greater corrosion resistance than that provided by the conventional zince chromate primer formerly used. Analysis of structures and parts coated with zinc chromate primer indicated this primer was too water-sensitive, permitting moisture to contact metal surfaces and promoting oxidation, as shown in fig. 1. Zinc chromate primer was also found to develop poor adhesion from prolonged exposure to moisture conditions.

Studies were directed toward developing an entirely new primer, and development of an easily-applied finish which could be sprayed over parts already coated with zinc chromate primer, since it was not always feasible or practical to strip structures before applying a better protective coating.

To adequately protect surfaces coated with zinc chromate primer which were failing but had not corroded, a fairly fast drying synthetic resin was chosen as a top coating to seal the porous primer and protect it from moisture. The resin selected was a clear synthetic alkyd, having a medium oil length of not less than 45 pct, of an oxidizing type, such as linseed and tung oil. This resin and oil length are similar to those used in synthetics for automobile painting.

Panels were prepared in the laboratory on 24ST and 75ST dural, 24ST and 75ST Alclad and magnesium, duplicating the exact conditions on the airplanes, in the following manner: (1) 24ST and 75ST dural panels were anodized and primed, using the conventional zinc chromate primer; (2) 24ST and 75ST Alclad panels were chromodized and primed, using the conventional zinc chromate primer; (3) magnesium panels

were Dichromated, given two coats of the conventional primer and one coat of gray synthetic enamel (alkyd type); and (4) panels were also prepared duplicating the three types listed above with the exception that one coat of the clear medium oiled alkyd was applied as a final finish.

These panels were subjected to tests for salt spray resistance, resistance to sun rays and weathering, flexibility, and fuel resistance.

Using the alkyd over zinc chromate primer solved the immediate corrosion problem; however, since this system presented the added expense of painting all airframe parts with an additional finish, a primer incorporating this type of resin and oil length had to be developed This new primer had to conform to all physical requirements of the zinc chromate primer commonly used in aircraft, and in many respects be superior, although the chemical structure would be different. Comparison of different blends was accomplished by coating panels and comparing with panels of the blends listed in table I, substituting each blend for the conventional primer. Tests conducted were as follows:

TABLE I

Composition of Blends Tested for Corrosion Resistance

Ingredient	Percent by Weight			
	Blend 1	Blend 2	Blend 3	Blend 4
Non-Volatile, Total	49.5	46	42	39
Volatile, Total	50.5	54	58	61
Pigment to Vehicle Solids:				
Pigment	53	49	44	39
Vehicle	47	51	56	61

(1) Salt spray tests were conducted in a standard salt spray cabinet (100 pct relative humidity at 100°F) for a total of 2300 hr.

(2) Panels for weather resistance were exposed for six months on a special rack built so that test panels were at 45° angle facing southeast. Test rack was located on the roof of the building.

(3) Panels coated with the blended primers were checked for lacquer resistance by the application of one spray-coat of specification lacquer over the blend, after allowing the latter to air dry 10 min, 1 hr, 16 hr, and 48 hr.

(4) Panels were air dried 48 hr and immersed in distilled water for 24 hr and checked for loss of adhesion, etc.

(5) For flexibility, panels were air dried 5 min and baked at 220°F, for 48 hr, then bent double.

(6) Panels were allowed to dry 48 hr and immersed in aviation fuel for 4 hr, followed by a 24-hr drying time at ambient temperature.

(7) The blended primers were checked for separation by the mixture of one part of primer and 2.5 parts of toluene, left standing for 4 and 24 hr, then agitated for 15 sec and sprayed to check for seediness and areas lacking in color.

(8) Drying times were checked to prevent delays in production.

Results of these tests showed that the blended primer panels were in perfect condition after the salt spray tests, while panels coated with the conventional primer were either corroded or the primer was washed off and the surface was ready to corrode, as shown in fig. 2. In the tests for weather resistance, panels coated with blended primers were again in perfect condition, but panels coated with conventional primer were streaked where water was gradually washing the coatings off. Blended primers also showed superiority in the water immersion tests.

Blends 2, 3, and 4, air-dried 10 min, failed in the lacquer resistance tests, as did blends 3 and 4, air-dried 1 hr, and blend 4, air-dried 16 hr.

Testing for flexibility, panels were bent double without rupturing, no blend showing signs of brittleness. One of the panels coated with blend 1, after 2300 hr in the salt spray, was bent until the metal broke without peeling or loosening the

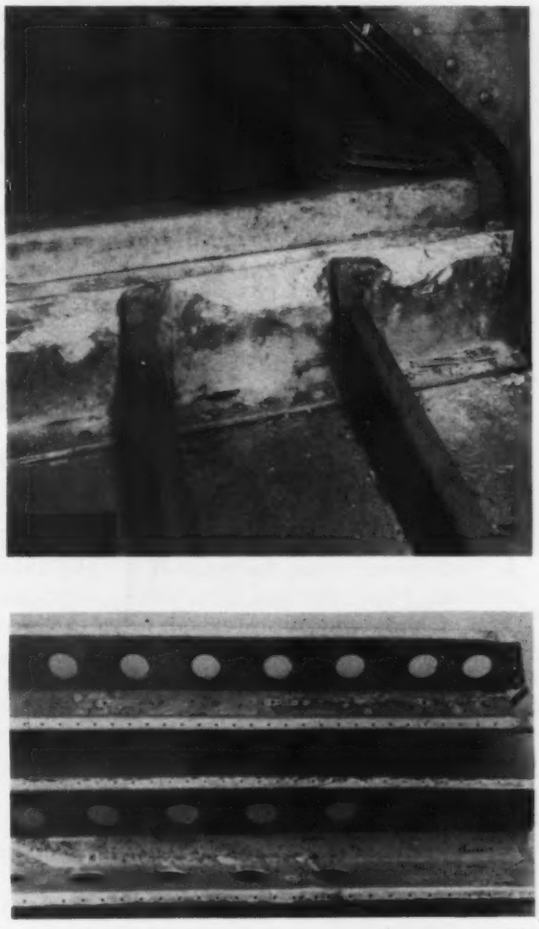


FIG. 1—Advanced corrosion of a rear lower spar and of upper wing skin stringers, in spite of the zinc chromate primer.

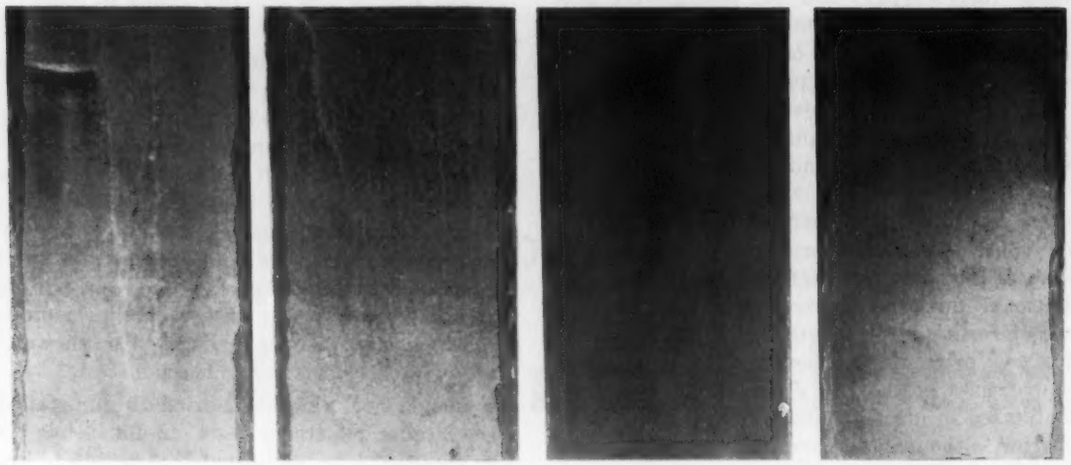


FIG. 2—Comparison of conventional primer (A and B) and Northrop seal primer (C and D) after 2300 hr exposure in a standard salt spray cabinet. Panels A and C are 24 ST aluminum; B and D are 75 ST grade.

primer. No detrimental effects from the gasoline immersion were observed. It was found that blended primer did not settle as rapidly as conventional primer, and in 15 sec was shaken to spray consistency without displaying seediness and areas lacking in color. Blend 1 had the shortest drying time.

Since blend 1 possessed the best overall qualities, further improvements were made in the medium-oiled alkyd, resulting in a new primer called Northrop Seal Primer No. 75. Extensive tests indicated that considerable improvement had been made in the original primer and that greater finishing advantages were obtained from its use.

The film, thickness for thickness, was equivalent or slightly superior in flexibility, and resistance to softening under moisture conditions was superior to conventional zinc chromate primer. Northrop Seal Primer offered considerably more protection in salt spray corrosion exposure, improved appearance, greater film strength and less porosity. Adhesion of other aircraft finishes was greater than with zinc chromate primer, and better gloss was achieved in lacquer or enamel coatings.

Tungsten-Iridium Thermocouple For Temperatures Above 2900°F

IN an effort to develop a thermocouple with usefulness beyond the range of the platinum-platinum, 10 pct rhodium type, various combinations of high temperature metals were explored for continued operation at elevated temperatures. his investigation, conducted by W. C. Troy and G. Steven, Armour Research Foundation and presented at the recent ASM annual meeting, was centered mainly on temperatures above 2900°F.

Operating between 2910° and 3630°F, calibrations were made for thermocouples representing combinations of tungsten, molybdenum, tantalum, platinum, rhodium, iridium and alloys of these metals. In a neutral atmosphere, optimum properties and performance were obtained with the tungsten-iridium thermocouple. Its features include high thermal emf, an almost linear calibration curve between 1830° and 3810°F, negligible room temperature emf obviating cold junction calibration, and thermoelectric stability while operating at high temperature for 120 hr in helium.

Use of pure metals eliminates the calibration difficulty associated with composition variations when alloy wires are used. It was found that definite limitations are associated with the use of tungsten from the standpoint of ambient atmosphere. This fact, coupled with the resulting embrittlement of the iridium when tested in a hydrogen atmosphere, indicates that the tungsten-iridium thermocouple is suitable for operation only in inert gases or a vacuum.

Woven wire fabric maker uses modified standard unit to increase productive capacity of 40-ft tower by 25 pct. Both first cost and operating expense are lower than those of previous system. Elimination of tackiness avoids former frequent shutdowns needed to clean rollers.

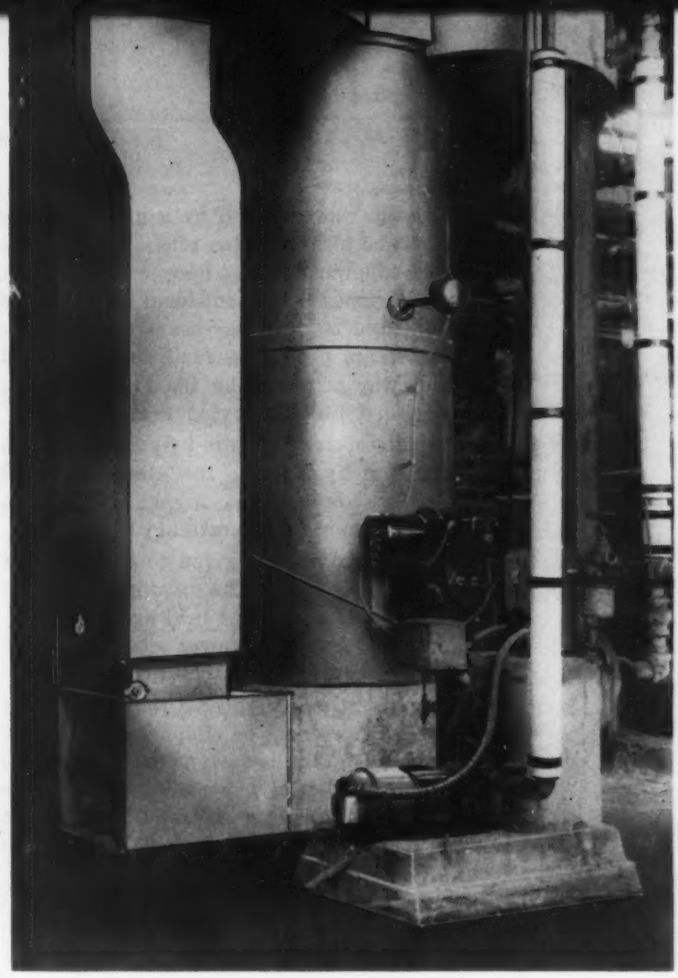


FIG. 1—Drying tower installation showing the heating unit and recirculating duct.

STANDARD SPACE HEATER IMPROVES DRYING TOWER

By **ROD LUTTGEN** *Vice-President, Engineering Products Corp., Bridgeport, Conn.*
and **E. M. TARNOFF** *Manager, Thermobloc Div., Prat-Daniel Corp., East Port Chester, Conn.*

IN an effort to perfect a more satisfactory method of developing high temperatures for drying zinc plating and lacquer finishes at their Georgetown, Conn., plant, Gilbert & Bennett Mfg. Co., producers of woven wire fabrics, adapted standard mass produced space heating units in a manner that not only produced results superior to their previous method, but affected a considerable saving in first cost and operating expenses.

In the processing of chicken wire, insect screen, wire fence, and similar wire products, Gilbert & Bennett employ 40 ft drying towers to set the finishes used on much of their wire and screen output. For rapid setting, the temperature within these towers had to be maintained at 200°F.

It was necessary for the heat producing unit to develop outlet air temperatures of from 400° to 500°F to offset the factor of cool make-up air introduced at the foot of the tower to check possible concentrations of solvent vapors and still retain enough heat for the process.

For several years acceptable results had been obtained by use of steam coils placed in the walls and at the center of the towers. Steam

for these coils was supplied by a high pressure boiler that was also used for other processes as well as for supplying heat. Recent enlargement of the plant imposed an additional load on this steam plant and made it necessary to either increase the steam producing facilities or to find some other way of providing the high temperature air needed for the drying towers.

Because direct-fired heaters by-pass the steam producing step by heating the air direct, and can, therefore, operate at higher efficiencies, the company decided to investigate this method.

First consideration was given to custom built equipment for producing the required temperatures. While this equipment held promise of excellent results and economical operation, the initial cost discouraged further exploration.

At this point it was suggested that a standard space heating unit could be adapted for the job. After a survey of the requirements of the job, Engineering Products Corp. made recommendations, and in collaboration with the Thermobloc Division of Prat-Daniel Corp., developed a suitable unit.

Slight Modification Required

Basing the solution on the standard oil fired Thermobloc No. 550, with output, for normal space heating, of 550,000 Btu per hr, it was shown that the outlet temperature could be raised by a simple modification of the standard Thermobloc involving only the addition of some duct work.

In order to maintain air velocities through the heater, a reciprocating duct was provided to take part of the warm air output and recycle it through the unit until the desired temperature rise was obtained. A damper was provided to balance the quantity of recycled air from the heater and new air from the room to secure the desired mix. The unit and duct arrangement are shown in figs. 1 and 2.

In the course of test work it was found that insulation of the duct work was absolutely necessary in order to reduce radiation losses to a minimum. Due to the design of the radiation shield in the Thermobloc, it was not found necessary to insulate the unit itself.

The temperature needed in the tower was 200°F, but to maintain this level the outlet temperature of the Thermobloc had to be 425°F to offset the room temperature make-up air constantly introduced at the foot of the tower to dissipate the solvent vapors inherent to the process.

In standard service producing warm air for space heating, the unit operates at overall thermal efficiencies in the range of 82 to 86 pct. Due

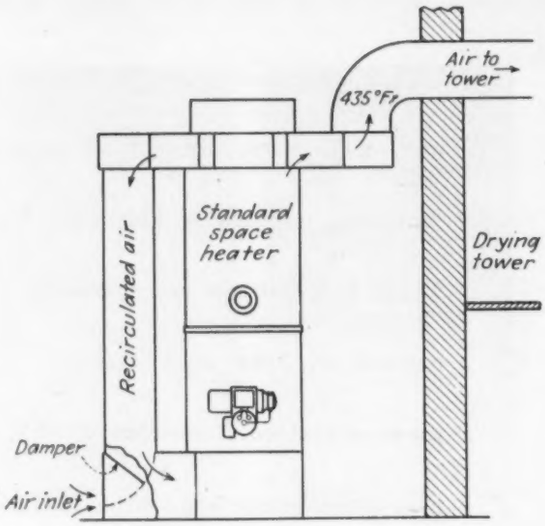


FIG. 2—Method of recycling the air. Note damper used to control the quantity of room air admitted to the unit.

to the higher air outlet temperatures at which this hot air producer was to operate, it was anticipated that the overall efficiency would be slightly lower, because the flue gas temperature would be higher. The data in table I were taken after all adjustments were made to give the required results.

Instead of using 4.6 gal of oil per hr, the normal rate of consumption when supplying 550,000 Btu per hr under space heating condition, the unit maintained the desired temperature at the drying tower on 4 gal per hr. Cost of operation was even less than had been anticipated.

Aside from this low maintenance factor, initial economy was also obtained. The standard Thermobloc unit, completely installed with all

TABLE I

Operating Data

Outlet air introduced into the tower	1120 cfm
Outlet air temperature	450°F
Room air temperature	84°F
Stack temperature	622°F
Stack CO_2	12 pct
Fuel Used	U. S. Commercial Std. No. 2 Fuel Oil
Consumption	4 gph
Heat content of oil	139,600 Btu per gal

Temperatures within tower (See fig. 3):

Distance from Base, ft	Temperature, °F
3	200
6	230
9	235
12	235
15	235
18	235
21	230
24	225
27	222
30	222

From the above data it was determined that the overall thermal efficiency was 80 pct:

Heat input	= 558,000 Btu per hr
Radiation loss to room	= 24,000 Btu per hr

(Actually this was not a loss, since it contributed to general heating)

Heat in the air introduced to the tower = 422,000 Btu per hr

necessary modification, cost $1670, or slightly more than half the quoted cost of a custom built heat transfer unit installation.

First cost and operating figures of the new method were substantially lower, and the quality of the work was vastly improved. The increased amount of air movement throughout the interior of the tower produced far better drying conditions than had the previous methods.

This faster drying permitted the company to re-arrange the interior of the towers to shorten the travel of the product and reduce the number of passes from eight to six, thereby increasing the production capacity of the tower by about 25 pct.

The previous arrangement had furnished heat by radiation, whereas the Thermobloc produced an initial blast directed at the first pass of the product. This effected a quicker setting of the finish and eliminated tackiness before the product reached the first top roller. This answered an old maintenance problem that had always hampered this drying process. With the tackiness of the finish under control, it is no longer necessary to make frequent shutdowns that had been required to scrape and clean the rollers.

Interchangeability was an added factor in the choice of a space heater for this drying tower. The operations at this factory are frequently changed. Should changes in the product or the process result in eliminating the drying tower, the space heating unit could be put to good use heating other portions of the plant without sacrificing the original investment.

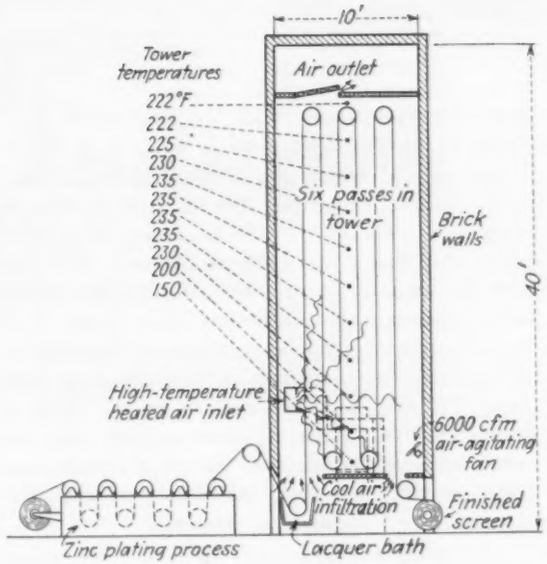


FIG. 3—Sketch of drying tower showing temperatures obtained at various levels.

A sketch of the drying tower and temperature readings at various levels are given in fig. 3. These temperatures are higher than those obtained with the previous equipment.

The present installation has proved sufficiently successful to warrant the ordering of another unit to equip a second tower.

Fractographic Studies of Ingot Iron

TOUGHNESS ratings based on the fractographic pattern are possible in commercial steels, since the gross pattern of the facet provides a qualitative measure of the difficulty of cleavage traverse. However, the profusion of fine detail observed within the various patterns themselves remained largely unexplained in previous fractographic studies. In an effort to develop this detail in clearer form and observe its response to certain treatments of the metal, an investigation was made by C. A. Zapffe and C. O. Worden, Baltimore, results of which were presented at the recent annual ASM meeting.

Fracture facets of ingot iron were studied fractographically in the preliminary investigation of deformation and cleavage phenomena. As with other materials, the patterns proved to be characteristic and reproducible, expressing features of original crystal growth, mechanical, thermal, and chemical treatment, and possible recrystallization in annealed specimens.

It was found that cold working destroys the cubic regularity of the annealed material, always producing instead a roughened and irregular surface typical of improved toughness, though sometimes also developing deformation markings of the Neumann band type on planes. Reannealing removes this effect and reproduces its own characteristic pattern.

Hydrogen embrittlement aggravates the cubic detail of annealed metal, and imposes a cubic pattern on cold-worked metal. Embrittlement is generally typified by a marked presence of rectilinear voids where blockets of metal have been removed during cleavage. This is considered to be an expression of the planar pressure activity of the gas, which literally explodes away small sections when cleavage suddenly relieves one dimension of the previously triaxial stress.

Patterns of iron treated thermally to increase the grain size often disclose a combination of lineage pattern and crystallographic traces which seem to relate directly to the phenomenon of recrystallization and grain growth, therefore raising questions requiring further study.

Continued from Page 81

Table IV shows ratings of the new steels compared to conventional steels.

The normal range of hot rolled and cold finished tensile properties for a 1-in. round is shown in table V. It will be noted that yield point and tensile strength of the new steel are slightly lower than conventional bessemer screw steel; however, this difference is so small as to be insignificant from an application standpoint. E steel has been applied on more than a hundred different applications which comprise a representative sample of conventional cold finished bessemer screw steel usage. In each case the new steel was fully satisfactory from the standpoint of mechanical properties.

Ability of the new steel to cold form more easily than standard bessemer grades was noticeable early in the development. A reliable test of cold forming ability was the bar drawing process itself, in which all of the material was subjected to a cold reducing operation to produce bars with smooth finish and close tolerance. Some of the smaller sizes were reduced approximately one-fourth in cross sectional area.

It is significant that less than normal breakage in production was experienced when the new steel was being cold finished. There are a number of applications where the ability of a free cutting material to take small amounts of cold work is an added advantage. Roll threading, knurling, or light coining are often performed on parts cut in screw machines. Results to date indicate that the new steel will be well suited to such applications.

One of the interesting qualities of this steel is its favorable magnetic properties. Although the special purpose magnetic steels differ considerably from bessemer steel in their composition and properties, the latter has been used on related applications where availability, ease of shaping, and low cost were the determining factors. The new steel possesses the additional favorable quality of low carbon. The lower carbon results in higher permeability and less hysteresis loss, both of which are important characteristics for a magnetic material.

Resume Your Reading on Page 82

AIRCOMATIC WELDING SPEEDS TANK FABRICATION

THE Aircomatic process for welding aluminum is being used in the fabrication of aluminum containers at Martin-Quaid Co., Philadelphia. The aluminum being welded is ⅜ in. thick, and the process was applied to the job on a production basis. All joints of the tank subassembly and 85 pct of the joints in the final assembly are continuous Aircomatic welds, with Heliwelding being used for the balance.

Prior to the introduction of the Aircomatic process, the company used Heliwelding. With this process, the total welding time on the 4 ft 1⅝ in. x 5 ft side section was 3 hr. Using Aircomatic, this welding time was reduced to 15 min.

One of the radical innovations in the new technique is the replacement of the conventional, non-consumable tungsten electrode with a continuously fed consumable wire. The wire is fed to the work through the barrel of the welding guns, and wire feed speeds range from 100 to 300 ipm.

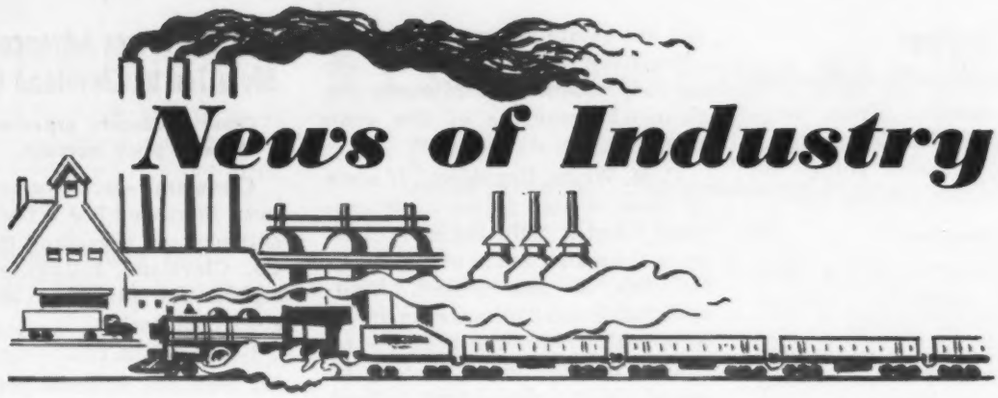
The filler metal carries the welding current and an arc is maintained between the end of the wire and the work. Power is supplied from a standard dc welding generator, the helium is used as the shielding gas. The welding grade of helium currently supplied for Heliwelding is suitable.

Specific data provided by Martin-Quaid Co. for a 45-in. long, 5/16-in. fillet weld on ⅜-in. thick 61ST aluminum plate are: *By manual Heliwelding*, 3/16-in. tungsten electrode, 20 cu ft per hr of helium with 225 amp, ac and ¼-in. filler rod manually fed. Total welding time, 30 min.

By manual Aircomatic welding, 1/16 in. 43S drawn aluminum wire automatically fed at a speed of 208 ipm, 210 amp dc, with 45 cu ft per hr of double charcoal, high purity helium. Total elapsed welding time, 2½ min.

With manual Heliwelding, the total fabricating time per tank averaged 280 hr, whereas with the Aircomatic process used in conjunction with Heliwelding the time was reduced to 48 hr per tank.

Aluminum (61ST) tanks, 5 x 3 1/3 x 4¾ ft weighing 1000 lb and holding 415 gal, are fabricated by Aircomatic welding using 1/16 in. electrodes deposited at a speed of 208 ipm.



Eastern Mill

Washington—U. S. Steel favors the Philadelphia-Trenton-New York area over New England as a site for an Atlantic seaboard mill. But the corporation will not oppose construction of an integrated steel plant in New England—provided it is done by private enterprise.

Benjamin Fairless, president of U. S. Steel, made the corporation's position clear in a statement before the Joint Committee on the Economic Report.

Speaking for his firm, he said, "We can understand the desire of the steel consumers and others located in New England to have an integrated steel plant . . . But markets, raw materials and financial factors have to be weighed, and it was our conclusion that the better location for us was the one indicated."

British Gray Iron Founders Group Touring American Plants

Washington — Members of a British gray iron founders team will visit at least 16 American plants over the next six weeks.

Because the team is interested in mass production and both machine and hand moulding rather than end products, the group will visit a variety of producers.

In addition to conferences with the International Moulders and Foundry Workers Union, the team will visit foundries and plants in New Jersey, New York, Pennsylvania, Ohio, Illinois and Wisconsin.

The Steel Hearings—A Political Flop

Industry leaders take the offensive in 4-day session on December price increases . . . Usual fireworks missing . . . But election-angle report will likely emerge.—*By GEORGE BAKER.*

Washington — A Congressional committee was studying a mass of steel-cost data this week in search of its own answer as to whether or not December price rises were "justified."

Steel producers argued repeatedly during 4 days of hearings before the Joint Economic Committee last week that the price rises were necessary due to rising costs, including workers' pensions.

But the United Steelworkers countered with the charge that cost data submitted by producers was "padded," and that pension costs could "easily" be absorbed by companies out of their "staggering" profits.

"Political" Report Likely

Despite the charges and countercharges raised during the 4-day view-airing conducted by Senator O'Mahoney, D., Wyo., there is nothing the committee or the Congress can do about price rises. The hearings served only two purposes: (1) They enabled both sides to present their cases to the public; and (2) they gave Congressmen a "natural" election-year opening to take pot-shots at either labor or management or both. The forthcoming committee report on the price "investigation" is expected to follow this latter line.

Enders M. Voorhees, chairman of U. S. Steel's finance committee, repeatedly drove home his point that steel companies spend their income in six different ways: wages, products and services, wear and exhaustion, taxes, interest, and reinvested income.

Where the Money Goes

"So where will you get the money for these pensions?" he asked. "From wages? Try to cut 'em. From products and services bought? Nobody wants to close plants down. From wear and exhaustion? That would start a depression and unemployment in the tool and equipment business. From taxes? There's nothing we can do about taxes—except pay 'em. From interest? We're obliged to keep up

Turn to Page 108

Constructing 600 Mile Pipeline

Washington—Northern Natural Gas Co. of Omaha has been authorized to construct 597 miles of 20- and 26-in. pipeline in Texas, Oklahoma, Kansas, Nebraska, Iowa, and Minnesota.

About 35,000 additional compressor hp will also be added. Estimated overall cost is nearly $52 million and will be completed by October 1950.

Steel Price Hearings

Continued from Page 107

interest payments. From reinvested income? That's necessary to keep the business going. So where's the money coming from?"

O'Mahoney Replies

"Maybe you could take a little out of each category," Senator O'Mahoney offered lamely.

But Otis Brubaker, speaking for the CIO, denounced Voorhees presentation, asserting that the price rises were not put into effect to offset high operating costs but to increase profits "already exorbitantly high." Mr. Brubaker contended that: Price increases averaged well above $4.00 a ton; that steelmaking costs have dropped and pensions will cost more than the added revenue. He charged that steel won't absorb new costs if the market will stand a price rise, though it could lower prices due to cost savings.

"Management" answers revolved about the rock-bottom argument that "costs are up; few companies are now making a fair return on investment; therefore prices must go up." Here's the way they expressed themselves:

Ben Fairless, U. S. Steel: "We favor pension and insurance benefits for our employees. Our earnings, however, are not sufficient to permit us to absorb the large cost involved. That is the reason we raised prices."

H. G. Batcheller, Allegheny Ludlum: "The price increases which we have thus far made and those which we may be forced to add in the immediate future are not only completely justified but are absolutely essential to preserve the financial resources of the company."

C. M. White, Republic: "If some of those in high places in government circles will begin to look upon the management of American industry as experienced, hard-working, honest citizens trying to do a real job for the good of the country instead of as a group of questionable characters whose every action must be viewed with suspicion, we will all get on much faster with the job of constantly increasing our standard of living."

Ben Moreel, Jones & Laughlin: "Steel is not yet selling high enough. Profits have been so meager that the industry is giving away its assets with every ton of steel sold."

Ernest T. Weir, National Steel: "The fundamental question is do we want a free, private economy in the United States or don't we?"

A. B. Homer, Bethlehem: "There can be no long-term security or survival for any industrial enterprise unless existing facilites are built or replaced from current sales revenues. Further increases in cost appear to be imminent."

William H. Colvin, Jr., Crucible Steel: "The question is, does the company receive adequate compensation for its quality product, considering the high man hours per ton, the small average size of the order, the irregularity of recurrent heats, and the expensive alloy content? The answer is not."

Resume Your Reading on Page 107

Contributed by Clement C. Caditz, president, Northern Metal Products Co., Chicago

Iron Ore Prices Advanced 50¢ a Ton by Cleveland Cliffs

Other producers expected to meet the new price increase.

Cleveland—Iron ore prices have been increased 50¢ a ton for 1950 shipment by Cleveland Cliffs Iron Co., Cleveland, following sales of substantial tonnages to several steel companies.

Based on the following schedule for iron ore of 51.50 pct natural iron content, the new prices are:

Mesabi range, nonbessemer	$7.70
Mesabi range, bessemer	7.85
Old range, nonbessemer	7.95
Old range, bessemer	8.10
High phosphorous	7.70

Prices are per gross ton delivered lower lake ports. Future increases, if any, in upper lake rail freight, handling charges and taxes thereon are for the buyer's account.

No immediate action was taken by other producers, but it is expected that they will meet the Cleveland Cliffs price advance.

Gives Reason for Increase

In a prepared statement, Cleveland Cliffs stated that "if the steel industry is to rely on an adequate supply of Lake Superior iron ore for many years in the future, an economically sound relationship between the ore price and the cost of production must be maintained.

"This must necessarily take into consideration not only the immediate needs for increasing underground production but encouragement of rapid development of new processes for the beneficiation of low-grade ore and taconite from which large tonnages of a high-grade product may be assured."

The statement also pointed out that depletion of the open pit mines during the past 10 years has brought about greater dependence on the higher-cost underground mines. If increased underground ore production is to be encouraged, the price of ore must be based on these higher production costs.

To produce the same tonnage,

underground mining requires six times as many men as open pit direct shipping ore and three to four times as many men as production of open pit ore requiring beneficiation.

Prefab Home Builder Gets Biggest RFC Loan in December

Washington — A loan of $1.5 million for purchase of additional facilities and working capital has been granted the Firth Sterling Steel & Carbide Corp. from Reconstruction Finance Corp. funds.

Other major loans approved by RFC during December included $2 million to Reo Motors, Inc., for working capital; Kerotest Mfg. Co., valve manufacturers, $1.2 million, for working capital and debt retirement; National Union Radio Corp., $1.4 million for purchase of equipment, working capital and debt retirement; and the Lumaghi Coal Co., $625,000 for machinery and equipment.

Largest amount approved during the month was $6 million for Crawford Home Loan Corp., a Louisiana corporation, for working capital. It is a wholly-owned subsidiary of Crawford Corp., a prefab manufacturer.

A loan application by West View Co., of Waterloo, for financing construction and operation of rental housing was approved as was another by Wolf Creek Lumber Co., of California, for working capital and purchase of machinery and equipment.

Completes Wire Mill Expansion

New York—To meet increasing demand for nickel-silver, and phosphor bronze alloys in small wire sizes and large diameter rods, the Riverside Metal Co., Riverside, N. J. has just completed expansion of its mill facilities. It can now supply wire as small as 0.005 in. in diam and rods as large as 4¾ in.

In addition to new wire drawing and rolling mill equipment, the new facilites include new casting equipment, annealing furnaces and materials handling equipment.

U. S. Steel to Begin Eastern Mill in 1951

Finished steel capacity to be 1.5 million tons, largely flat-rolled products . . . Venezuelan ore to be brought in within the next 5 years—*By TOM C. CAMPBELL*

New York—THE IRON AGE has often in the past predicted that U. S. Steel would some day build an Eastern Mill. Well U. S. Steel *will* build a mill. And it won't be too long before the first dirt is turned at the site near Trenton, N. J.

If things go well construction on the new eastern mill will start in 1951. It may take as long as 3 years to finish the mill, since it will be integrated. But it will use ore from the fabulous U. S. Steel find in Venezuela (reported first in THE IRON AGE Dec. 1, 1949).

Capacity—2 Million Tons

As things look now, the mill will have about 2 million tons of ingot capacity a year. This means that the finished steel production at full operation could run around 1,460,000 tons a year. Most of that will be flat-rolled steel items.

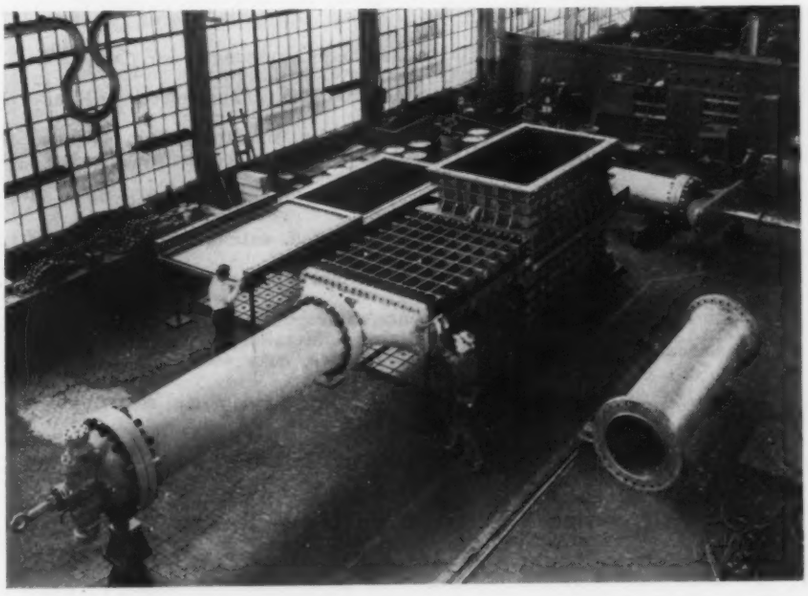
The new mill will be U. S. Steel's answer to higher freight rates, intense competition and the growth of the West Coast. After all, an Eastern seaboard mill is really a West Coast mill also.

Ore from Venezuela

The Venezuela ore will start moving into this country through Mobile within the next 5 years. The first year of full movement should be about 10 million tons. About 3 million of this will go to the TC&I plant of U. S. Steel at Birmingham and the balance—if the Eastern mill is completed—will go to the eastern seaboard. If there is any hitch, temporarily, the ore will go to Pittsburgh. But that is unlikely.

U. S. Steel still has to get appropriations for the mill but they are a foregone conclusion.

FLOOD CONTROL GATES: The Conemaugh Dam, key to the flood control system protecting industrial western Pennsylvania, will contain 26 of these 35-ton gates being built at the Metal Products Div. of Koppers Co., Inc., Baltimore. The gates will be completed in 1950 at a cost of $1,237,000. A network of flood control dams was started after the great 1936 flood, which caused extensive damage and loss of life in the area centering about Pittsburgh.



Pittsburgh Firm First To Utilize New Fabrication Device

Pittsburgh — A Pittsburgh district company will be the first fabricator to use the reverse-draw method of producing deep-drawn shapes in sizes and weights other than small parts in light gage metal proviously produced by this method.

A 750-ton press, built by the Hydraulic Press Manufacturing Co., Mt. Gilead, Ohio, is being installed at the Oakmont, Pa., plant of the Scaife Co., and will be used first in the production of liquefied petroleum gas cylinders. Later, other tanks and pressure vessels will be produced.

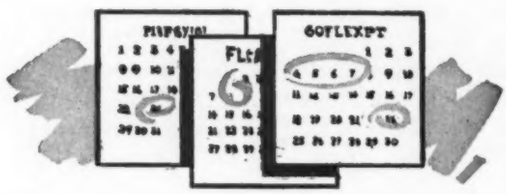
Press Is Chief Equipment

Principal equipment is a forming press, with dies which make a deep-drawn cylinder-half in a single, continuous stroke. A circular 12 ga. steel blank 38¼ in. in diameter is first formed into a cup of conventional proportions, and then literally turned inside out by a second ram, to form a cup 14½ in. in diameter and 24½ in. deep. This cylinder-half will be welded to another half to form a complete cylinder.

Small Business Group Names Head

Cleveland—John I. Lucas, president, Yoder Co., Cleveland, has been named president of Smaller Business of America, Inc.

Ralph R. West, president of West Steel Casting Co., has been elected first vice president, Jules Eshner, attorney, was chosen second vice president and William J. Franz, president W. J. Franz & Co., has been named secretary.



Dates to Remember

• REMEMBER THE MARCH OF DIMES •

Feb. 12-16	**American Institute of Mining & Metallurgical Engineers,** annual meeting, New York.
Feb. 15-16	**American Hot Dip Galvanizers Assn.,** annual meeting, Cincinnati.
Feb. 27-Mar. 3	**American Society for Testing Materials,** spring meeting, Pittsburgh.
Mar. 14-16	**Society of Automotive Engineers,** passenger car, body and production meeting, Detroit.
Mar. 20-25	**Concrete Reinforcing Steel Institute,** annual meeting, Houston.
Mar. 21-22	**Steel Founders' Society of America,** annual meeting, Chicago.
Apr. 3-4	**Assn. of Iron & Steel Engineers,** spring conference, Birmingham.
Apr. 4-7	**National Assn. of Corrosion Engineers,** annual conference, St. Louis.
Apr. 4-8	**Chicago Technical Societies Council,** national production exposition, Chicago.
Apr. 5-7	**American Institute of Electrical Engineers,** conference on electric welding, Detroit.
Apr. 5-7	**Midwest Power Conference,** Chicago.
Apr. 10-12	**American Institute of Mining & Metallurgical Engineers,** annual openhearth, blast furnace, coke oven and raw materials conference, Cincinnati.
Apr. 10-14	**American Society of Tool Engineers,** industrial cost-cutting exposition, Philadelphia.
Apr. 11-12	**American Zinc Institute,** annual meeting, St. Louis.
Apr. 12-14	**American Society of Mechanical Engineers,** spring meeting, Washington.
Apr. 12-14	**National Petroleum Assn.,** semiannual meeting, Cleveland.
Apr. 24-	**Packaging Machinery Manufacturers Institute,** semiannual meeting, Chicago.
Apr. 25-26	**Metal Powder Assn.,** annual metal powder show, Detroit.
Apr. 27-28	**American Steel Warehouse Assn.,** annual meeting, Houston.

Koppers Will Supervise A $50 Million ECA Job in Turkey

Pittsburgh — The Koppers Co. will supervise a $50 million engineering and construction program in Turkey under ECA during the next 4 years.

Joseph Becker, vice president and general manager of Koppers Engineering and Construction Div., said the program would involve construction of two new docks and a large breakwater at the port of Zonguldak, on the Black Sea; improvement of mining facilities, including the building of new tipples and two coal preparation plants, and construction of approximately eight miles of railroad and a complete switching and transfer station.

Koppers also will inspect the equipment for the projects which will come from the United States and Europe, including Turkey itself.

Small Business Awarded 27 Pct of Defense Contracts

Washington—About $1.5 billion or about 27 pct of the dollar volume of military purchases for the fiscal year 1949 went to small business, the Defense Dept. reported to the White House recently.

This report covers prime contracts only, the department said, and takes no account of the amount of business going to small business in the form of subcontracts.

Agree on Insurance Program

Pittsburgh—Allegheny Ludlum Steel Corp. and United Steelworkers of America (CIO), have agreed on details of an expanded program of group insurance for approximately 12,000 production employees.

The new program, effective Feb. 15, provides liberalization of sickness, accident, surgical and hospital benefits for employees, and increased hospitalization and new surgical benefits for dependents. It will be financed by company and employee contribution.

U. S. Steel Tells About Its Mountain of Ore in Venezuela

Washington — At last week's steel price hearings U. S. Steel for the first time told the story of its important discovery in 1948 of an immense iron ore deposit in Venezuela. This find consists of an iron ore range, including a mountain of ore called Cerro Bolivar, believed to be as large in tonnage as the famous Hull-Rust Mine in the Mesabi Range. Iron content is higher than that found in the Mesabi.

For a complete account of American interest in Venezuelan iron ore, as well as U. S. Steel's mountain of ore, Cerro Bolivar, see THE IRON AGE, Dec. 30, 1948, p. 71 and Mar. 3, 1949, p. 149—Ed.

John G. Munson, vice-president in charge of raw materials, reviewed the present heavy drain on Lake Superior ore and pointed out the seriousness to industry and defense if they are exhausted.

Following Both Roads

He said U. S. Steel recognized this possibility and after the war renewed its active search for new sources of ore. Two roads were open: (1) Development of an economical process for recovery of iron from taconite; (2) importation of foreign ore. U. S. Steel decided to follow both roads.

Recently a new subsidiary, the Orinoco Mining Co., was organized to develop the Venezuelan ore property. The biggest problem here is to get the ore to the coast.

At Duluth, Minn. the corporation has a large laboratory working to determine the best methods for recovering iron content from taconite. Mr. Munson said U. S. Steel hopes to be able to ship a considerable quantity of taconite agglomerates within a few years.

Chilton Board Elects Campbell

Philadelphia—Tom C. Campbell, editor, THE IRON AGE, and Frank P. Tighe, editor, *Motor Age*, were elected to the board of directors of Chilton Co., parent company of both publications, at a board meeting held here last week.

INDUSTRIAL SHORTS

GRANTS LICENSE — Trabon Engineering Corp., Cleveland, has licensed EXACTOR CONTROL CO., LTD., London, England, to produce their automatic grease and oil lubricating systems. The British company has organized a division to be known as Exactor-Trabon with a new factory near London.

PLATE AWARD — A contract for floor plate for a new $3 million plant now under construction outside Philadelphia has been awarded to the ALAN WOOD STEEL CO., Conshohocken, Pa.

CHANGES HANDS — It has been announced that the CENTRAL STEEL & WIRE CO., Chicago, will own and operate the Edgar T. Ward's Sons Co. plant in Milwaukee.

MAY MERGE — An agreement contemplating the merger of Frederic B. Stevens, Inc., Detroit, producer of foundry supplies and polishing compounds, into the UDYLITE CORP., Detroit, manufacturer of plating machinery, supplies and equipment, has been announced.

EAST TO WEST—R. D. Wood Co., Philadelphia, manufacturers of hydraulic presses, has appointed E. V. PRENTICE CO., Portland, Ore., as exclusive Pacific Northwest sales representative.

NEW DEPOT — A new brass mill products depot at 4105 W. Chicago Ave., Chicago, has been built by SCOVILL MFG. CO., Waterbury, Conn. This new location will be manned by both the Mill Products Div. and Manufacturing Divs. personnel.

MOVES—C. I. CRAIS CO., New Orleans, sales representative for Lukens Steel Co. and its divisions, has moved its offices to 529 American Life Bldg., Birmingham.

NOW PRODUCING—Formerly an industrial consultant on protective coatings and corrosion control, HOUGHTON LABORATORIES, INC., Olean, N. Y., is now manufacturing a series of new anticorrosive metal primers and surface coatings and a new plastic material. In addition, the company has built a pilot plant and research facilities to test Hysol products.

OPENS BRANCH—A sales office in Houston has been opened by KAISER STEEL CORP., Oakland, Calif., to handle their sales of steel line pipe in the Southwest. L. G. Johnson, formerly in the sales department of Republic Steel, will be in charge of the new office.

HEADS CGA—Kenneth G. Jobson, manager, Cylinder Maintenance and Testing Dept. of the Linde Air Products Co., New York, has been elected president of the COMPRESSED GAS ASSN.

MORE SPACE — The completion of a large modernization and expansion program has been announced by HICKORY SPRINGS MFG. CO., INC., Hickory, N. C., manufacturers of equipment for the bedding industry. This expansion will allow up to 75 pct more production.

EXPANDS LINE — All assets except plant of the Wright Hoist Div. of the Lisbon Hoist & Crane Co., Lisbon, Ohio, has been purchased by the OHIO ELECTRIC MFG. CO., Cleveland. The Bob-Cat hoist will be manufactured in the Ohio Electric plant with full production scheduled for early April.

TAKES OVER—The automatic air hydraulic drill head manufactured by the Cleveland Republic Tool Corp. has been acquired by the ROCKWELL MFG. CO. and will be produced by the Delta Mfg. Div. in Milwaukee.

Atlas Steel Preparing To Tap Canadian Stainless Market

First mills now being installed with production set for fall

Pittsburgh—Atlas Steels, Ltd. of Welland, Canada, is getting set to go after the stainless steel sheet market in that country.

The first mills in Canada for the production of stainless sheets are now being installed, and are scheduled for full operation by early fall, according to R. H. Davis, Atlas president. Chances are that some sheets will be coming off the mills this summer.

This will cut into the Canadian export market of American stainless steel producers. While not large, the Canadian market is an "interesting" one, according to an executive of one of the leading stainless mills in this country.

Installing Hand Mills

One of the interesting aspects of this development is that the two mills now being installed in the mile-long Atlas plant are hand mills —a type fast disappearing in America since the advent of the more efficient continuous mills.

From Atlas' point of view, however, the hand mills, for the present at least, are more economical since the demand for stainless sheets in Canada is still small, and a continuous mill could be kept in operation only a small percentage of the time. The capacity of the hand mills is enough to supply several times Canada's present market. It was pointed out that even in the manufacture of carbon sheet Canadian manufacturers are only beginning to produce by wide strip mills.

Promoting Stainless

While the mills are being installed, Atlas is launching an extensive three-year program of market development for stainless steel products in Canada by acquainting fabricators with the latest production techniques and educating the Canadian public with the advantages of alloy steel products.

On Feb. 15 Atlas is starting publication of a monthly magazine directed to fabricators, and has on the press the first two of 10 technical booklets covering various phases of fabrication. In addition, fabricators will be offered technical assistance as well as designing service. A marketing and merchandising department is being set up in the company's sales division.

Atlas has made stainless steel rod, bar and wire since 1930 together with a full line of tool and specialty steels. Its plant is the largest of its kind in the British Commonwealth.

ECA Finances Mining of Jamaica Bauxite

Advances $11 million to new subsidiary of Reynolds Metals Co. . . . Reserves estimated at more than 300 million tons of high-grade ore—*By JOHN ANTHONY*

New York—The vast Caribbean reserves of high grade bauxite ore will within a few years begin to supplement and extend the life of the vanishing domestic bauxite reserves of Arkansas. This will assure the domestic aluminum industry of a continuous supply of ore even in the event of another war.

Principal sources of bauxite for U. S. aluminum production during World War II were Surinam (Dutch Guiana) and British Guiana, both located some 2500 miles from Gulf ports. The shipping route lies in part through exposed waters of the North Atlantic. More than 100 bauxite carrying vessels were destroyed by enemy submarines during 1942 and 1943.

"Come back in a few years, we don't want to discourage you completely."

Last week the Economic Cooperation Administration agreed to advance $11 million to a newly organized subsidiary of Reynolds Metals Co., Reynolds Jamaica Mines, Ltd., to develop Jamaica bauxite deposits. The Reynolds reserves are estimated at more than 300 million tons of high grade ore.

Ore Is High Grade

Aluminum Co. of Canada also holds property in Jamaica with at least the equivalent of the Reynolds potential reserves. So far, Alcan has not concluded its negotiations with the Jamaica government. Kaiser Aluminum & Chemical Corp. has also had a party drilling and making tests on its property holdings in Jamaica.

The Jamaica ore is high grade, averaging 50 pct alumina. It is very low in silica content, which ranges from ½ to 2½ pct. The low silica content is desirable because it steps up output of alumina from the ore. High silica content tends to combine with soda ash and carries away this costly reagent.

Used Low-Grade Ore

During the war the Aluminum Co. of America used Arkansas ores containing 6 to 7 pct silica. By sintering at Hurricane Creek, Reynolds was able to make use of Arkansas ores ranging from 13 to 14 pct silica, thus extending the Arkansas reserves. The highest

grade Surinam ore runs about 3 pct silica. When it becomes possible, in a few years, to blend the low silica Jamaica ore with the higher silica domestic ore, the life of Arkansas reserves will be prolonged still further. Blending will permit the use of Arkansas bauxite running even higher than 14 pct silica.

Will Pay With Ingots

Reynolds Metals Co. has already spent more than a million dollars on exploration, drilling and rerearch to assure the usability of Jamaica ores. It will spend another million for unloading facilities at a Gulf port, probably Mobile or New Orleans, and handling facilities at Hurricane Creek plant.

Negotiations between Reynolds and ECA have been under way for the past year. ECA will advance nearly $6 million in dollars, the balance in British counterpart funds. The advances will be repaid over a 20-year period by delivery of aluminum ingots to the stockpile. The government has an option to purchase up to $6 million of aluminum at market prices, of which half is deliverable within 2 years, the balance deliverable the following year.

Jamaica bauxite occurs virtually on the surface. Only 9 in. of overburden must be removed. The ore can also be used without washing. Reynolds' facilities at Jamaica will include a drying plant to reduce moisture, eliminate dust and save shipping costs.

Much of the Jamaica bauxite is found at very high altitudes. Transportation to seaboard will therefore be by means of overhead tramrail. The ore can then be loaded directly into large ocean-going vessels.

New Prices Squeezing Nonintegrated Mills

Mills converting hot-rolled strip to cold-rolled find their costs are higher . . . Seek ways to cut costs . . . Some may buy and slit wider widths. —BY JOHN DELANEY

Pittsburgh — The fellows who buy hot-rolled strip and convert it into cold-rolled for re-sale are finding it hard to make ends meet these days. In fact, some of them are not quite making it.

Chances are that most—if not all—of these cold rollers will soon find it necessary to jack up the base price of their product to ease the pressure. At least two producers have already increased the price on heavier gages $5 per ton. This is likely to set the pattern.

Price Pattern Hurting

The cold rollers say their dilemma is due to the pattern of price changes made last December by the integrated mills on hot-rolled and cold-rolled strip.

This is what happened:

Hot-rolled strip prices were increased an average of $8.50 per ton, due solely to changes in extra charges. Base price was unchanged.

Cold-rolled strip prices were increased $3 per ton on base. No changes in extras.

Thus, on an average the cold rollers found their costs increased $5.50 per ton—the difference between $8.50 and $3—if they were to remain competitive with the integrated producers.

Widths Are Important

Averages can be misleading, however. To the cold roller equipped to handle widths in excess of 24-in.—and there are few of them—the increases on hot-rolled were below the average. His position is not quite so difficult. But to the converter who must buy in the narrower widths, the increases on hot-rolled run anywhere from $10 to more than $15 per ton.

The cold rollers also point out that they are saddled with some of the same higher costs as the integrated mills, such as pension and social insurance benefits for

Turn to Page 115

Businessmen's Opinion Asked on Antitrust Laws

Washington—Businessmen were invited by Commerce Secretary Sawyer recently to tell what they think of the Administration's antitrust policies. Mr. Sawyer, in a questionnaire mailed to about 400 business, labor, and consumer groups, asked for opinions as to the effectiveness of voluntary-compliance antitrust programs and what changes should be made in existing antitrust laws to stimulate competition.

Reynolds Reports Details On Its Expansion Program

Richmond, Va.—Aluminum foil operations of Reynolds Metals Co. have been extensively expanded on the West Coast with the establishment of a new aluminum foil processing plant at Vernon, Calif., and the opening of an additional sales office at Fresno, Calif. This move is aimed at bringing manufacture closer to customers, thus providing better service.

Reynolds has also launched an $8 million expansion program in its Alabama operations. This expansion includes the installation of new Lewis foil mills which operate at a speed of nearly a mile a minute; General Electric annealing ovens and high speed processing units. The new rolling mills will allow Reynolds for the first time to produce much wider foil in one operation.

Mehl Handed Metallurgy Post

Pittsburgh—Dr. Robert F. Mehl of Carnegie Institute of Technology has been appointed chairman of the committee of metallurgy of the Research and Development Board, National Military Establishment. Dr. Mehl is director of Carnegie's Metals Research Laboratory and head of the school's metallurgical engineering dept.

Dr. Mehl is investigating the problem of coordinating all the metallurgical research and development undertaken by the many technical agencies of the military departments and will advise on immediate problems.

Quality Control Indicator Designed to Lower Reject Rate

Electric calculating machine is used to locate machine trouble.

New York—An instrument designed to lower the rate of rejects in any mass production operation has been developed by the GE General Engineering & Consulting Laboratory. This instrument, known as a Quality Control Indicator, has its operation based upon the theory of statistical quality control.

Developed originally for the company's appliance and merchandise department, the Quality Control Indicator is reported to have cut reject rates 60 pct at the GE refrigerator assembly line at Erie, Pa. An average rate of rejects of 2.7 pct, for a check of five characteristics on this assembly line, has been lowered to 0.89 pct through use of this instrument during the six month pilot installation.

Locates Trouble Quickly

The Quality Control Indicator is an electric calculating machine that keeps an automatic continuous check on reject rates in manufacturing operations making possible the location of abnormal production difficulties as quickly as they occur.

Basic equipment consists of a "Totalizer" that counts the total number of units inspected, and a Characteristic Analyzer that counts the number of rejects for a particular characteristic. Easy check on the reject rate is made possible by the continuous indicating quality meter in the Analyzer. When the reject level at an inspection station exceeds a predetermined rate, the needle on the meter moves from the green half of the scale to the red half, indicating to supervisors that corrective action is needed.

Operates Electrically

In operation, the QCI uses various signaling devices such as an electric eye or a switch tripped by passing objects to continually tabulate, on the Totalizer, the number of articles produced. The number of rejects are relayed to the Characteristic Analyzer by the inspector who presses a button each time a particular characteristic is rejected. The electro-mechanical setup continuously computes the rate of rejects. Setting the selector on the front of each panel for the acceptable reject rate determines the red-green dividing line on the scale. Reject levels ranging from zero to 10 pct may be monitored, the quality level to be used being determined by previous production experience.

Expect More Defense Spending for Aircraft

Defense Dept. budget cut to $13.7 billion . . . But spending for some items will be increased 25 pct . . . Combat vehicles and aircraft slated for bigger share.

Washington—Despite a cutback to $13.7 billion in the proposed Defense Dept. budget for 1950-51, it is indicated that purchases of aircraft, tanks and combat vehicles, arms and ammunition, trucks and other motor vehicles are to be increased by as much as 25 pct.

Officials estimate that defense spending will require about $3 billion of the total budget for the foregoing purposes—a rise of about $600 million over current spending.

Nor is there any indication of more than a minor reduction in the amount to be spent in maintaining a fleet of more than 51,000 passenger cars and more than 1000 airplanes maintained by various government departments for transportation and use of administrative personnel.

Spend More on Planes

Biggest dollar volume of defense spending lies with aviation and its related fields. Official estimates are about $2.1 billion, including $30 million for development and testing of pilotless aircraft and guided missiles.

Aircraft procurement estimates are based on the size of the active

November Blast Furnace Production

As Reported to American Iron & Steel Institute

	Number of Companies	Annual Blast Furnace Capacity	PRODUCTION							
			PIG IRON		FERRO-MANGANESE AND SPIEGEL		TOTAL			
									Pct of Capacity	
			Current Month	Year to Date	Current Month	Year to Date	Current Month	Year to Date	Current Month	Year to Date
Distribution by Districts:										
Eastern	12	13,353,580	1,000,536	10,552,812	19,518	285,073	1,020,054	10,837,885	90.1	81.2
Pittsburgh-Youngstown	17	26,625,920	1,977,355	19,923,511	20,282	202,155	1,997,637	20,125,666	88.5	75.6
Cleveland-Detroit	6	6,984,600	540,213	5,422,008	.....	.....	540,213	5,422,008	91.2	77.6
Chicago	7	15,655,390	1,050,232	11,370,764	.....	25,838	1,050,232	11,396,602	79.1	72.8
Southern	9	5,010,060	425,699	4,191,267	7,331	79,498	433,030	4,270,765	102.0	85.2
Western	4	2,912,300	189,549	2,153,417	.....	.....	189,549	2,153,417	76.8	73.9
Total	37	70,541,850	5,183,584	53,613,779	47,131	592,564	5,230,715	54,206,343	87.6	76.8

fleets, keyed to a 48-group Air Force. The Air Force estimates next year's purchases at 1383 aircraft totaling more than 21 million lb of air frames. Cost would be about $1.4 billion.

Navy is proposing procurement of 769 new aircraft, for about 8.1 million lb of airframes. This would include aircraft for both the Marine Corps and Navy-Marine reserves which maintain a fleet of 1840 planes and 4 airships. Expenditures would amount to $650 million.

Designed for Cold Climate

Industry may also expect about $63 million in orders for tanks, combat vehicles, and their components during the coming year. While this is considerably less than the amount actually spent in 1949, it would be double the amount of estimated contracts for 1950.

These expenditures would go for partial replacement of obsolete equipment, for new prime movers and anti-aircraft weapons, and

Turn to Page 116

November Finished Steel Shipments

As Reported to American Iron and Steel Institute

Steel Products	Mills Reporting	Item	NOVEMBER - 1949			To Date This Year		
			Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale) (Net Tons)	Per cent of Total Shipments	Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale (Net Tons)	Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale) (Net Tons)	Per cent of Total Shipments	Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale (Net Tons)
Ingots, blooms, slabs, billets, tube rounds, sheet and tin bars, etc.	47	1	104,023	3.2	82,077	• 1,993,961	3.8	•1,847,559
Skelp	6	2	4,571	0.1	25,458	• 100,112	0.2	• 397,104
Wire rods	21	3	39,902	1.2	22,170	508,791	1.0	230,573
Structural shapes (heavy)	14	4	215,401	6.5	70	3,313,433	6.3	18,768
Steel piling	4	5	12,725	0.4		281,285	0.5	1,557
Plates	28	6	289,945	8.8	25,727	• 5,218,615	9.9	352,268
Rails—Standard (over 60 lbs.)	8	7	26,678	0.8	-	1,632,633	3.1	6,560
Rails—All other	3	8	4,544	0.1		108,886	0.2	1,520
Joint bars	7	9	2,458	0.1	388	97,024	0.2	25,082
Tie plates	6	10	10,855	0.3	-	351,770	0.7	41
Track spikes	8	11	3,002	0.1	-	88,560	0.2	35
Wheels (rolled or forged)	5	12	12,951	0.4	-	262,969	0.5	598
Axles	2	13	4,222	0.1	-	154,397	0.3	29
Hot rolled bars (including light shapes)	40	14	325,316	9.9	27,112	•5,790,593	11.0	• 564,491
Hot rolled bars—Reinforcing	28	15	124,891	3.8	-	•1,432,488	2.7	2,279
Cold finished bars	33	16	55,565	1.7	218	•1,114,190	2.1	5,911
Tool steel bars	17	17	3,518	0.1	25	52,023	0.1	544
Pipe—Standard	17	18	125,069	3.8	2,045	• 1,884,895	3.6	43,993
Pipe—Line	14	19	188,397	5.7	790	2,252,530	4.4	15,553
Pipe—Oil country goods	14	20	49,302	1.5	2,520	• 1,231,893	2.3	75,990
Tubes—Boiler	3	21	4,387	0.1	318	• 101,084	0.2	7,685
Tubes—Mechanical and pressure	21	22	24,043	0.7	437	570,591	1.1	13,640
Miscellaneous pipe (including conduit)	12	23	8,972	0.3	-	• 291,598	0.5	1,134
Wire—Drawn	38	24	153,792	4.7	4,710	• 1,897,461	3.6	103,691
Wire—Nails and staples	17	25	43,245	1.3	405	660,866	1.3	6,873
Wire—Barbed and twisted	15	26	10,857	0.3	-	200,216	0.4	32
Wire—Woven wire fence	13	27	18,916	0.6	-	330,331	0.6	1,504
Wire—Bale ties	12	28	1,496	0.1	-	• 40,094	0.1	-
Black plate	10	29	24,222	0.7	31	• 415,785	0.8	285
Tin and terne plate—Hot dipped	10	30	105,318	3.2	-	• 1,554,795	3.0	10
Tin plate—Electrolytic	10	31	139,379	4.2	-	• 1,812,398	3.4	42
Sheets—Hot rolled	28	32	359,402	10.9	33,582	• 5,591,390	10.6	557,962
Sheets—Cold rolled	16	33	474,154	14.4	504	• 6,199,709	11.8	14,813
Sheets—Galvanized	15	34	118,642	3.6	21	• 1,565,529	3.0	525
Sheets—Long terne	9	35	9,192	0.3	-	136,182	0.3	505
Sheets—Enameling	8	36	7,367	0.2	-	• 143,574	0.3	1,631
Sheets—Electrical	11	37	21,303	0.7	-	343,643	0.6	-
Strip—Hot rolled	28	38	89,716	2.7	10,016	• 1,501,872	2.9	230,672
Strip—Cold rolled	35	39	77,924	2.4	781	• 1,328,313	2.5	20,116
All other	3	40	177	-	-	1,301	-	-
Total steel products	138	41	3,296,809	100.0	239,408	•52,514,774	100.0	•4,591,355

During 1948 the companies included above represented 99.5 % of the total output of finished rolled steel products as reported to the American Iron and Steel Institute.

• Revised.

UP Building 3000 Freight Cars

Omaha—Union Pacific R.R. will spend approximately $23 million and employ 645 additional shop men in a freight car acquisition program to begin this spring.

One thousand gondola cars will be purchased from General American Transportation Corp. of Chicago. The railroad itself will build 3000 cars in its own shops.

New passenger equipment representing an expenditure of more than a million and a half dollars was put into service by Union Pacific last month.

Dresser Earnings Decline

Cleveland—Net earnings of Dresser Industries, Inc., for its fiscal year ended Oct. 31, 1949, were $3,525,182 on net sales of $80,629,805, equivalent to $3.02 per share of common stock. Earnings for the previous year were $8,038,422 on net sales of $108,636,897, equivalent to $7.14 per share of common stock.

Small Mills Have Problems

Continued from Page 113

employees, increased freight charges and so on.

Easiest solution, of course, would be for the integrated mills to revise cold-rolled extras upward in a range comparable to those made in hot-rolled. This would place the cold rollers in pretty much the same cost-selling price position as before—perhaps even improve their position.

But present indications are that changes in the cold-rolled extras are not likely to be made soon. Chances are that such revisions, if any, must await a thorough study of cold-rolled production costs by the integrated mills.

Meanwhile, the cold rollers have their problems.

In addition to the squeeze on prices, some of them say they are not getting enough hot-rolled strip to maintain a satisfactory level of operations. One producer is operating at less than 50 pct of capacity. Another estimates that the probable average for the industry is about 70 pct. At this rate, the cold rollers say, it's difficult, if not impossible to make money. This is especially true of the producer of plain carbon strip. The specialty producers have more of a margin to play around with.

Seek Ways to Cut Costs

All of the cold rollers are looking into the cost-saving possibilities of buying in the wider widths and slitting to meet their requirements. Offsetting any cost saving in this direction, however, are these considerations: (1) Investment in slitting facilities; (2) cost of slitting, and (3) increased cost of rolling slit hot-rolled to standard tolerances or closer.

One cold roller is having his slitting done on the outside to determine whether he can still meet his customers' tolerance specifications, before investing in a slitter of his own.

Resume Your Reading on Page 113

Viewing the News from

The ECONOMIC SIDE

By JOSEPH STAGG LAWRENCE

"Faith and Finance"

THE Executive mountain labored and brought forth a mouse. In his message on the budget, the President had indicated a deficit of more than $5 billion for the fiscal year starting next July 1st. The fact was noted without alarm. In due course the President would speak to Congress and indicate ways and means for bringing revenue and expenditure into balance.

That message has just been delivered and, to nobody's surprise, it proved to be a political rather than a fiscal document. It is a nice piece of broken field-running, with adroit dodging and opportune stiff-arming. It is not unfair to say that the message never intended to balance the budget.

In the first place, it provides material for the record. It "proves" that the President did not ignore the deficit; that he did speak to Congress; that proposals were made which, had Congress acted on them, might have avoided the deficit.

In the second place, the document was designed to snag votes for the Administration. This is a yeoman ambition for a message which had to deal with excessive government costs and inadequate income. To cut outlay would hurt some people; to raise taxes would hurt others. This is not a good formula for winning friends and influencing people.

It is a tribute to the Presidential scribes that a painful, politically costly duty was performed with the calculus of votes showing a net gain. To luggage manufacturers, theatre operators, transportation agencies, 'phone and wire companies, retailers, and a vast body of consumers, the prospect of a cut in taxes was extended.

The millions of individual income taxpayers in the lower brackets were not disturbed. Only corporations earning more than $50,000 a year were to be tapped for additional revenue. This would hit only 10 pct of all companies. One can almost read between the lines the comment that these large, successful companies do not carry much political weight.

Further necessary revenue can be obtained by plugging loopholes through which the rich, the powerful, and the privileged escape their due tax burdens. The insurance companies, one gathers, now pay no taxes. Depletion allowances for oil and mining are abused. Nonprofit organizations are engaged in profitable business on which they pay no taxes.

The whole message emits an unctuous odor of justice. It drools with good intentions. The budget is to be balanced if Congress has the probity and courage to slap down the wicked tax dodgers. The consumer, at the same time, may be relieved of odious excise taxes which reduce consumption and predispose the economy to depressions—again provided that Congress is willing to see its clear duty and has the guts to perform it.

The message is a masterpiece in bland buck-passing.

It reveals little of the courage which it implies is wanting in Congress. About the tough task of cost-cutting, the message says: "Drastic reductions in federal expenditures in the wrong places and at the wrong time could have serious disruptive effects throughout our economy." Here is a danger which must not be incurred—in an election year.

What the message misses completely is the fact that confidence is a stimulant without price in a healthy economy; that resolute action in limiting outgo and income —as all the rest of us must do to remain solvent—assures a faith in government without which business cannot long prosper.

Defense Spending

Continued from Page 115

some of the more recently developed tracked vehicles for testing. Emphasis will be placed on items designed for use in cold climates.

An additional $67 million is estimated for procurement of other than combat motor vehicles. This includes proposed purchases of trailers, of which there is a current military shortage.

Plan Many Replacements

It also provides for replacements for the military transport service. The Defense Dept. is currently operating about 30,000 vehicles in the U. S. and another 27,000 overseas. Many of these vehicles, dating back to the war, are at least 5 years old.

In addition, official estimates would require another $43.5 million for replacement and addition of airplanes and passenger vehicles for administrative personnel of the government departments.

Some 51,000 passenger vehicles (including station wagons, some busses, and a few ambulances) and 1005 aircraft (including 50 charged to the Treasury Dept. for use of the Coast Guard) are now maintained.

Little Trimming Expected

It is proposed to exchange 21 of these aircraft for 98 new planes (50 for the Coast Guard), thus increasing the total to more than 1100. The cost, after allowance for exchanges, would amount to about $32 million.

Whether the orders are actually placed next year depends upon Congressional appropriations, of course. But the foregoing figures are official estimates of what the departments and agencies are asking for.

Should Congress decide to trim the President's budget requests to any appreciable extent, departmental buying plans may have to be revised in varying degrees. But it is a safe guess that it will change actual defense buying to only a small degree.

Resume Your Reading on Page 115

STEEL COMPANY EARNINGS — 1949 AND 1948

Company	Fourth Quarter '49	Fourth Quarter '48	1949 12 Months	1948 12 Months
Bethlehem Steel Co.	$16,365,137	$37,163,702	$99,283,539	$90,347,560
Inland Steel	1,171,070	13,787,373	25,013,707	38,606,889
Colorado Fuel & Iron	*823,004*	3,270,597	591,828*	5,696,257*
Wheeling Steel	*381,968*	5,358,400	7,896,265	15,050,045
Crucible Steel			1,330,000	3,596,177
Keystone Steel	1,845,756	922,350	3,112,411*	1,782,588*
Carpenter Steel			517,007	656,616

* 6 Months
Italics — deficit

Bethlehem Adding Sheet Capacity in East

Grace reveals $30 million project to boost Sparrows Point flat-rolled capacity by 40 pct . . . More electrolytic tinplate output included . . . 1949 earnings set record at $99 million.

New York—Bethlehem Steel Co. will increase the flat-rolled steel capacity of its Sparows Point plant by 900,000 tons a year with a $30 million project scheduled for completion within 15 months.

In describing the new construction program which is now underway, Eugene G. Grace, Bethlehem board chairman, also revealed that additional electrolytic tinplate capacity was included in the project. The announcement was made at the company's quarterly press conference at which record earnings of $99,283,539 were reported for 1949.

Income Gains 10 Pct

Backbone of the new facilities will be a new 68-in. cold mill and an additional stand for the present 58-in. cold mill. Ingots to feed the added capacity will be slabbed at Bethlehem and Steelton. The project will step up Sparrows Point's flat-rolled capacity by 40 pct. The plant is currently shipping about 185,000 tons of flat-rolled steel a month, of which some 65,000 tons is tinplate.

Bethlehem's 1949 net income was some 10 pct better than the $90,347,560 profit reported for 1948. It amounted to 12 pct on investment and 7.8 pct on sales. Mr. Grace roughly estimated that the steel strike had cost the company about $12 million.

He reported that ingot capacity had been increased to 15 million tons a year, or 800,000 tons above the Jan. 1, 1949 figure. Current steel production is at 95 pct of capacity, he said. Five blast furnaces are off for lack of coal or the rate would be 100 pct, he noted.

Steel order backlogs were $289 million at the end of last year, as contrasted with $417 million at the end of 1948. In tons, the respective figures are 2,524,000 and 3,574,000. The Sept. 30, 1949 steel order backlog was $207 million. Net billings for the corporation were $1,266,843,001 for 1949, against $1,312,556,417 in 1948. Shipments were 9,217,000 tons last year, compared to 9,993,000 tons in 1948.

Sperry Co. Gets Big Order For Gunfire Control System

New York—A military contract representing the largest peace time order in its history, has been received by the Sperry Gyroscope Co. from U. S. Army Ordnance Department. It calls for production in quantity of a new and highly-complex anti-aircraft gunfire control system.

The order is the outcome of an Army Ordnance-Sperry development. As part of the development program, pilot models of the system were produced by the Sperry engineering laboratories.

Lewis Welding Acquires Euclid Plant of Joy Mfg. Co.

New Lewis plant was originally built to make machine tools.

Cleveland — Purchase of the Euclid, Ohio, plant and equipment of Joy Mfg. Co., Pittsburgh, by Lewis Welding & Engineering Corp., Bedford, Ohio, has been announced by J. T. Lewis, Jr., president of Lewis Welding.

Mr. Lewis said the new plant would be organized as a separate manufacturing division and will do machine work and machine assembly work as the Breckenridge Machine Div. of Lewis Welding & Engineering Corp. Approximately 150 employees will be added to the Lewis payroll.

Built to Make Machine Tools

The new Lewis plant for years was an established Cleveland concern known as the Breckenridge Machine Co. Since 1946 it has been operated by Joy Mfg., a leading manufacturer of automatic coal mining equipment.

The plant was built and equipped originally to manufacture machine tools, and the new Breckenridge division has a wide range of production facilities. Particular emphasis will be placed on construction of special machinery for the metalworking fields, in addition to the usual general machine work which was always a part of the business.

Will Do Contract Work

Mr. Lewis said purchase of the plant resulted from Joy Manufacturing Co.'s recently announced program of rearranging, consolidating and improving its manufacturing operations. Lewis Welding will continue to handle Joy Mfg. work at the Breckenridge plant on a contract basis until the Joy concern is prepared to absorb such work in other of its six factories.

Mr. Lewis pointed out that there would be no change in the Bedford operation of Lewis Welding, which was established in 1948 and has grown steadily in the field of arc welding. At present the company employs 190 men.

Structural Steel Bookings Rise

1949 bookings totaled 1,432,972 . . . 1949 shipments reported 7 pct under corresponding 1948 figure.

New York—The estimated total bookings of fabricated structural steel for 1949 totaled 1,432,972 tons as compared with 1,965,769 tons for the preceding year. December bookings amounted to 124,251 tons, a 20 pct increase over November.

Shipments for 1949 were 1,853,536 tons, a 7 pct decrease from the 1,993,902 tons shipped in 1948. This decrease is attributable to the reduced shipments made during October and November due to the effects of the steel strike.

The backlog (tonnage available for future fabrication) for the next 4 months only, stands at 555,360 tons.

Following is the complete tabulation of bookings and shipments:

		Estimated Total Tonnage for the Entire Industry	
	1949		Ave.
CONTRACTS	CLOSED	1948	1936/1940
Jan.	130,418	160,634	107,578
Feb.	108,764	130,119	96,280
Mar.	149,079	213,123	124,558
Apr.	98,802	154,082	110,783
May	116,975	141,764	126,237
June	96,952	162,367	125,835
July	126,255	177,687	152,481
Aug.	98,953	172,485	113,135
Sept.	120,373	180,422	137,982
Oct.	158,593*	162,739	141,557
Nov.	103,557*	140,794	129,757
Dec.	124,251	169,553	143,313
Totals	1,432,972	1,965,769	1,509,496
SHIPMENTS			
Jan.	152,746	146,363	92,578
Feb.	145,879	141,556	88,626
Mar.	185,885	167,029	115,031
Apr.	179,206	166,687	123,650
May	171,101	186,915	123,225
June	172,260	137,109	129,969
July	147,960	160,780	127,422
Aug.	183,868	176,306	136,389
Sept.	162,139	174,967	137,255
Oct.	99,812*	164,024	140,944
Nov.	117,180*	169,796	127,373
Dec.	135,500	182,370	121,664
Totals	1,853,536	1,993,902	1,464,626
TONNAGE AVAILABLE FOR FABRICATION WITHIN THE NEXT 4 MONTHS	555,360	669,651	363,288

*Revised

Construction Steel Awards

Fabricated steel awards this week included the following:

2500 Tons, Philadelphia, country club center and apartment building, through Turner Construction Co., Philadelphia, to American Bridge Co., Pittsburgh.

1375 Tons, Ft. Wayne, Ind., Allen County Coliseum to Ft. Wayne Structural Steel Co., Ft. Wayne, Ind.

900 Tons, San Jose, Calif., telescope building, Mt. Hamilton observatory, University of California, through Carrico & Gautier, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

500 Tons, Washington, Springarn High School, Cramer and Volmerhausen, Washington, low bidders.

310 Tons, King County, Wash., Alaskan Way viaduct, to Pacific Car & Foundry Co., Renton, Wash.

250 Tons, Deerfield, Mass., 4 span steel stringer bridge with reinforced concrete. Warner Brothers Corp., Sunderland, Mass., low bidder.

230 Tons, Queens, N. Y., apartment house, Wetherole St. & 66 Ave., to Grand Iron Works, Inc., N. Y.

145 Tons, Philadelphia, Tabor Ave. bridge, City of Philadelphia, contract B-110, Kaufman Construction Co., Philadelphia, low bidder.

125 Tons, Chicago, warehouse for Atlantic Steel Co., to Jos. T. Ryerson & Son, Chicago.

105 Tons, Lancaster, Pa., boiler house, building No. 40, Armstrong Cork Co., to A. B. Rote Co., Lancaster, Pa.

Fabricated steel inquiries this week included the following:

1940 Tons, Boston, reconstruction of Sullivan Sq. and vicinity, Charlestown District.

1565 Tons, Needham, Wellesley, Newton and Weston, Mass., bituminous concrete with bridges on circumferential highway, Route 128, 7 bridges and a viaduct. Completion date Nov. 1, 1950. Fred D. Sabin, district engineer.

800 Tons, Philadelphia, terminal building for International Airport, City of Philadelphia, due Feb. 28.

350 Tons, Boston, hospital for Veterans' Administration, due Feb. 4.

305 Tons, Denver, road construction, State Highway 20, Mother Grundy to Forks Creek, State Highway Engineer, Denver, to Feb. 3.

300 Tons, Lexington, Ky., boiler house for Veterans' Administration hospital, due. Feb. 10.

200 Tons, Philadelphia, addition to warehouse, due Feb. 3.

190 Tons, Burlington, Mass., 2 bridges and bituminous concrete surfacing.

165 Tons, Columbia and Lycoming Counties, Pa., construction of 2 plate girder bridges and one reinforced concrete bridge. Secretary of Highways, Harrisburg, Pa. Bids to Feb. 17.

155 Tons, Contra Costa County, Calif., highway and bridge construction between Port Chicago Road and Pittsburg, California Div. of Highways, Sacramento. Bids to Feb. 23.

Reinforcing bar awards this week included the following:

5300 Tons, Chicago, apartment building 1350 Lake Shore Drive, to Bethlehem Steel Co., Bethlehem.

3100 Tons, Pittsburgh, Veterans' Hospital to Bethlehem Steel Co., Bethlehem.

1495 Tons, King County, Wash., Alaskan Way viaduct, to Bethlehem Pacific Coast Steel Corp., San Francisco.

500 Tons, Norristown, Pa., sewage treatment plant, City of Norristown, Progressive Builders, Pennsauken, N. J., low bidder.

220 Tons, Spokane, Wash., construction on Ririe N. E. Road and Poplar N. W. Road, through Hansen & Parr, to Bethlehem Steel Co., Bethlehem.

215 Tons, Dexter, Ore., section of S. P. RR. relocation and Oregon State Highway 58, through Leonard & Slate Oregon Ltd., Portland, to Mercer Steel Co.

135 Tons, Sandwich, Mass., 3 concrete rigid frame bridges with bituminous concrete ramps. Campanella & Cardi Construction Co., Hillsgrove, R. I.

100 Tons, Mauch Chunk, Pa., Route 550(7), Pennsylvania Dept. of Highways, to Pine Brook Iron Works, Scranton, Pa.

Reinforcing bar inquiries this week included the following:

2625 Tons, Boston, reconstruction of Sullivan Sq. and vicinity, Charlestown District.

1500 Tons, Chicago, apartment building on Lake Shore Drive at Barry.

950 Tons, San Diego, Calif., construction on Wabash Blvd., City Clerk, San Diego. Bids to Feb. 21.

860 Tons, Needham, Wellesley, Newton and Weston, Mass., 7 bridges and a viaduct, one circumferential highway, Route 128. Completion date Nov. 1, 1950. Fred D. Sabin, district engineer.

775 Tons, Los Angeles, Compton Creek improvement, Los Angeles District, Corps of Engineers, CIVENG-04-353.30-26. Bids to Feb. 24.

155 Tons, Contra Costa County, Calif., highway and bridge construction between Port Chicago Road and Pittsburg, Calif. Div. of Highways, Sacramento. Bids to Feb. 23.

120 Tons, Denver, road construction, State Highway 20, Mother Grundy to Forks Creek, State Highway Engineer, Denver, to Feb. 3.

115 Tons, Perry County, Pa., construction of 3 reinforced concrete bridges, Secretary of Highways, Harrisburg, Pa. Bids to Feb. 17.

110 Tons, Morton Grove, Ill., Eden's Parkway bridge section 0506-1HB.

105 Tons, Morton Grove, Ill., Eden's Parkway bridge section 0505-1HB.

100 Tons, Wilmette, Ill., Eden's Parkway bridge section 0809-1HB.

Scrap Institute Elects

Washington—Stanley M. Kaplan, M. S. Kaplan Co., Chicago, was elected president of the Institute of Scrap Iron & Steel at its 22nd annual convention here last week. Ralph E. Ablon, Luria Bros. & Co., New York, became first vice-president and Clarence E. Cohen, I. J. Cohen & Co., Kansas City, was re-elected second vice-president.

Elected secretary was M. L. Chase, Luntz Iron & Steel Co., Canton, Ohio. Samuel G. Keywell, Samuel G. Keywell Co., Detroit, was again re-elected treasurer of the institute. Edwin C. Barringer continues as executive vice-president.

New directors are: Leonard H. Krieger, Southwest Steel Corp., Pittsburgh; Sidney Byer, Houston Compressed Steel Corp., Houston; and David C. Holub, Holub Iron & Steel Co., Akron.

Marvin S., Plant, H. Klaff Co., Baltimore; Harold Weinstein, Calumet Iron & Supply Co., East Chicago, Ind.; and Albert Levinson, General Pipe & Supply Co., Los Angeles; were re-elected directors.

Low Bidder on Vet Hospital

Washington — Merritt-Chapman & Scott of New York was low bidder at $12,845,000, for general construction of a 900-bed veterans' hospital to be built at West Haven, Conn. Westinghouse Electric Corp. was low bidder at $460,000 for elevator and related construction.

Briefs and Bulletins

coal trouble—Republic Steel has 2 blast furnaces off and by early this week had lost 5000 tons of steel output. Youngstown Sheet & Tube, with 2 blast furnaces banked, began losing steel on Jan. 30. Crucible has cut back steelmaking by about 25 pct. Sharon banked a blast furnace this week. Wheeling has had a furnace off for 2 weeks but expects to lose no steel until Feb. 6, when it will cut back steelmaking 50 pct if the coal strike is still on. Bethlehem, with 5 furnaces banked, is losing steel at the rate of 15,000 tons a week. Inland has banked one furnace, lost no steel.

Truman steps in—Resumption of full coal production by Monday, Feb. 6, for at least a 70-day period, was asked by President Truman on Tuesday of this week. He said he would appoint a Fact-Finding Board, outside the Taft-Hartley Act, whose findings would not be binding on either party. He set noon, Saturday, February 4, as the deadline for acceptance of his proposal to resume full production, and if this should be rejected, by 5 p.m. Saturday, for acceptance of the Voluntary Fact-Finding Board.

coke ovens—Weirton Steel Co. has awarded Koppers Co., Inc., a contract for the construction of a battery of 61 coke ovens, and alterations and extensions on the by-product and benzol plants at its Weirton, W. Va., plant. The project will be completed late this year. The new ovens will be capable of carborizing 1500 tons of coal per day.

U. S. Steel earnings—U. S. Steel Corp. reported net income of $165,958,806 for 1949, compared to $129,627,845 earned in 1948. Fourth quarter earnings for 1949 and 1948 were $32,735,397 and $41,510,274 respectively. Net billings were $2,302,443,094 last year. In 1948 they totaled $2,481,508,535.

postponed—The Federal Trade Commission has postponed oral argument on the steel industry's proposal to end the commission's price-fixing complaint. Argument on the order to terminate the charges now is tentatively set for Feb. 14. It was originally scheduled for Jan. 31.

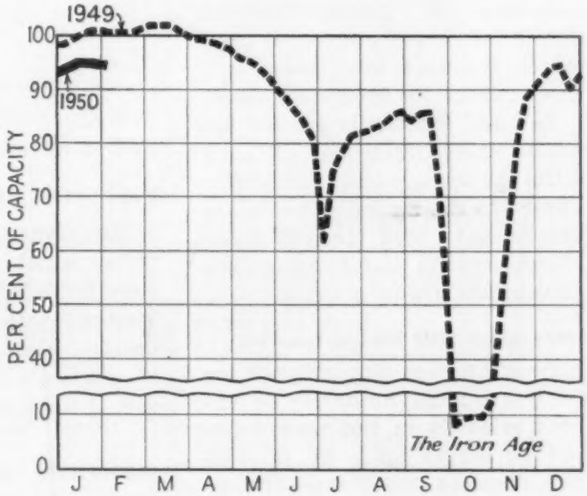
capital goods—Structural steel fabricating business prospects in the East look good for at least the next 5 months. Manufacturing buildings are off, but school, hospital and bridge business is better than it was.

eastern market—Tubular products demand is strong. Wire rod business is easy because the mild eastern winter sent the tire chain market into a skid. There are some gray market offerings and foreign nails are quoted at $6.20 a keg delivered Philadelphia vs. $6.23 f.o.b. Sparrows Point. Prospective new sheet customers are not likely to get much for the first half.

stainless in television—In forecasting the tonnage of stainless steel which the television industry is expected to consume this year (Jan. 12, p. 75) there was a typographical error. The forecast should have been 15,000 to 20,000 tons for the year. If we were making the forecast today, we think an estimate of 10,000 tons for the year would be more accurate.

selling stock—Lone Star Steel Co. has filed a registration statement with the Securities & Exchange Commission prior to offering an issue of 592,185 shares of common stock for sale at $4 a share $1 par. Proceeds are to be used for construction of cast iron pressure pipe foundries at an estimated cost of $1,250,000. Remainder of the proceeds will be applied against debt retirement.

Steel Operations



District Operating Rates—Per Cent of Capacity

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
January 22.....	95.5*	98.0	90.0	89.5	100.0	95.5*	101.0	103.0	105.0*	91.0	85.0	87.0	91.5	94.0
January 29.....	96.0	97.5	88.0	90.5	100.0	101.5	102.5	103.0	103.0	91.5	84.5	89.0	91.0	93.0

* Revised.

Nonferrous METALS OUTLOOK

Market Activities

by John Anthony

Activity in copper market continues . . . Fabricators' business fall in December . . . Palmerton strike ends . . . Will ease Special High Grade . . . Tin drops twice in week.

New York—Copper is the one metal in which the current market is booming. Sales for January by the end of last week were reported at 106,800 tons. With the carryover from December, total January shipments should reach 116,000 tons, in addition to the tonnage going to the strategic stockpile. Sales for February shipment so far are reported at 58,000 tons, which indicates that this month should reach 100,000 tons or more.

Rod and wire mills are not operated at maximum capacity, and wire bar tonnage is being freely offered to the market. Conflicting reports have been received about the state of the tubing market, but tube billets are in heavy demand.

December Mill Operations Off

December was a poor month for the brass mills, according to figures released in the trade. December orders taken by fabricators required 92,207 tons of copper, 24,000 less than in the previous month. December shipments by fabricators were only 86,097 tons (copper content), a drop of nearly 22,000 tons.

Use of copper by fabricators in December was lower than in any month since the low point last July. The reduction in volume is attributed to the year end, coupled with the general use of the last-in-first-out method of accounting.

Palmerton Strike Ends

The zinc market has been affected by the coal strike. Pressure is definitely off the Prime Western market. The shortage of special High Grade which has been acute will be relieved by the end of the strike last week at the Palmerton, Pa., plant of New Jersey Zinc Co. This strike has been in effect for more than 4 months. It was settled on the basis of $100 a month pension including social security. Welfare benefits are subject to negotiation up to Aug. 1. There was no wage increase, but the contract is reopenable by either party on Apri. 1. It is expected to be a month before operations are resumed and backlogs are taken care of.

The lead market is very quiet. There is no export business, and foreign lead is still coming into the country.

The price of tin was reduced another ½¢ on Monday, following quickly after the reduction last Thursday. This brings the price to 74½¢ per lb for spot. Prompt at 74½¢. February is 74⅛¢, March is 74¢ and April is 73⅞¢.

NONFERROUS METALS PRICES

	Jan. 25	Jan. 26	Jan. 27	Jan. 28	Jan. 30	Jan. 31
Copper, electro, Conn.	18.50	18.50	18.50	18.50	18.50	18.50
Copper, Lake, Conn.	18.625	18.625	18.625	18.625	18.625	18.625
Tin, Straits, New York	75.50	75.00	75.00	75.00	74.50	74.50
Zinc, East St. Louis	9.75	9.75	9.75	9.75	9.75	9.75
Lead, St. Louis	11.80	11.80	11.80	11.80	11.80	11.80

Note: Quotations are going prices.

MONTHLY AVERAGE PRICES

The average prices of the major nonferrous metals in January based on quotations appearing in THE IRON AGE, were as follows:

	Cents Per Pound
Electrolytic copper, Conn. Valley	18.50
Lake copper, Conn. Valley	18.625
Straits tin, New York	75.750
Zinc, East St. Louis	9.763
Zinc, New York	9.483
Lead, St. Louis	11.80
Lead, New York	12.00

Mill Products

Aluminum

(Base prices, cents per pound, base 30,000 lb, f.o.b. shipping point, freight allowed)

Flat Sheet: 0.188 in., 2S, 3S, 26.9¢; 4S, 61S-O, 28.8¢; 52S, 30.9¢; 24S-O, 24S-OAL, 29.8¢; 75S-O, 75S-OAL, 36.3¢; 0.081 in., 2S, 3S, 27.9¢; 4S, 61S-O, 30.2¢; 52S, 32.3¢; 24S-O, 24S-OAL, 30.9¢; 75S-O, 75S-OAL, 38¢; 0.032 in., 2S, 3S, 29.5¢; 4S, 61S-O, 33.5¢; 52S, 36.2¢; 24S-O, 24S-OAL, 37.9¢; 75S-O, 75S-OAL, 47.6¢.

Plate: ¼ in. and heavier: 2S, 3S, F, 23.8¢; 4S-F, 26¢; 52S-F, 27.1¢; 61S-O, 26.6¢; 24S-F, 24S-FAL, 27.1¢; 75S-F, 75S-FAL, 33.9¢.

Extruded Solid Shapes: Shape factors 1 to 4, 33.6¢ to 64¢; 11 to 13, 34.6¢ to 76¢; 23 to 25 36.7¢ to $1.05; 35 to 37, 44¢ to $1.53; 47 to 49, 63.5¢ to $2.20.

Rod, Rolled: 1.5 to 4.5 in., 2S-F, 3S-F, 34¢ to 30.5¢; Cold-finished, 0.375 to 3 in., 2S, 3S, 36.5¢ to 32¢.

Screw Machine Stock: Rounds, 11S-T3, R317-T4; ⅛ to 11/32 in., 49¢ to 38¢; ⅜ to 1½ in., 37.5¢ to 35.5¢; 1 9/16 to 3 in., 35.5¢ to 32.5¢; 17S-T4 lower by 1¢ per lb. Base 5000 lb.

Drawn Wire: Coiled, 0.051 to 0.374 in.; 2S, 36¢ to 26.5¢; 52S, 44¢ to 32¢; 56S, 47¢ to 38.5¢; 17S-T4, 50¢ to 34.5¢; 61S-T4, 44.5¢ to 34¢; 75S-T-6, 76¢ to 55¢.

Magnesium

(Cents per lb, f.o.b. mill, freight allowed)

Sheets and Plate: Ma, FSa, ¼ in., 54¢-56¢; 0.188 in., 56¢-58¢; B & S gage 8, 58¢-60¢; 10, 59¢-61¢; 12, 63¢-65¢; 14, 69¢-74¢; 16, 76¢-81¢; 18, 84¢-89¢; 20, 96¢-$1.01; 22, $1.22-$1.31; 24, $1.62-$1.75. Specification grade higher. Base: 30,000 lb.

Extruded Round Rod: M, diam in., ¼ to 0.311, 58¢; ½ to ¾, 46¢; 1¼ to 1.749, 43¢; 2½ to 5, 41¢. Other alloys higher. Base: Up to ¾ in. diam., 10,000 lb; ¾ in. to 1¾ in., 20,000 lb; 1¾ in. and larger, 30,000 lb.

Extruded Square, Hex. Bar: M, size across flats, in., ¼ to 0.311, 61¢; ½ to 0.749, 48¢; 1¼ to 1.749, 44¢; 2½ to 4, 42¢. Other alloys higher. Base: Up to ¾ in. diam, 10,000 lb; ¾ in. to 1¾ in., 20,000 lb; 1¾ in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangle: M, in weight per ft, for perimeters of less than size indicated, 0.10 to 0.11 lb per ft, per. up to 3.5 in., 55¢; 0.22 to 0.25 lb per ft, per. up to 5.9 in., 51¢; 0.50 to 0.59 lb per ft, per. up to 8.6 in., 47¢; 1.8 to 2.59 lb per ft, per. up to 19.5 in., 44¢; 4 to 6 lb per ft, per. up to 28 in., 43¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb; ½ lb to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057, ¼ to 5/16, $1.14; 5/16 to ⅜, $1.02; ½ to ⅝, 76¢; 1 to 2 in., 65¢; 0.065 to 0.082, ⅜ to 7/16, 85¢; ⅝ to ¾, 62¢; 1 to 2 in., 57¢; 0.165 to 0.219, ⅝ to ¾, 54.5¢; 1 to 2 in., 53¢; 3 to 4 in., 49¢. Other alloys higher. Base, OD in in.: Up to 1½ in., 10,000 lb; 1½ in. to 3 in., 20,000 lb; 3 in. and larger, 30,000 lb.

Nickel and Monel

(Base prices, cents per lb, f.o.b. mill)

	Nickel	Monel
Sheets, cold-rolled	60	47
Strip, cold-rolled	66	50
Rods and bars	56	45
Angles, hot-rolled	56	45
Plates	58	46
Seamless tubes	89	80
Shot and blocks	..	40

Copper, Brass, Bronze

(Cents per lb, freight prepaid on 200 lb)

	Sheets	Rods	Extruded Shapes
Copper	32.18	....	31.78
Copper, h-r	....	28.03	....
Copper, drawn	....	29.28	....
Low brass	30.12	29.81	33.03*
Yellow brass	28.69	28.38	31.70*
Red brass	30.60	30.29	33.51*
Naval brass	33.51	27.57	28.82
Leaded brass	....	23.19	27.22
Com'l bronze	31.61	31.30	34.27*
Manganese bronze	37.01	36.92	32.42
Phosphor bronze	50.90	51.15	....
Muntz metal	31.58	27.14	28.39
Everdur, Herculoy, Olympic, etc.	37.19	36.14	....
Nickel silver, 10 pct	39.66	41.87	46.80
Arch. bronze	....	....	27.22

*Seamless tubing.

Primary Metals

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, 10,000 lb, freight allowed	17.00
Aluminum pig	16.00
Antimony, American, Laredo, Tex.	28.75
Beryllium copper, 3.75-4.25% Be dollars per lb contained Be	$24.50
Beryllium aluminum 5% Be, dollars per lb contained Be	$52.00
Bismuth, ton lots	$2.00
Cadmium, del'd	$2.00
Cobalt, 97-99% (per lb)	$1.80 to $1.87
Copper, electro, Conn. Valley	18.50
Copper, lake, Conn. Valley	18.625
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$100 to $110
Lead, St. Louis	11.80
Lead, New York	12.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex.	20.50
Magnesium, sticks, 100 to 5000 lb	36¢ to 38¢
Mercury, dollars per 76-lb flask f.o.b. New York	$70 to $73
Nickel, electro, f.o.b. New York	42.97
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$69 to $72
Silver, New York, cents per oz.	73.25
Tin, New York	74.50
Zinc, East St. Louis	9.75
Zinc, New York	10.47
Zirconium copper, 10-12 pct Zr, per lb contained Zr	$12.00

Remelted Metals

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5-5 ingot	
No. 115	16.75-18.25
No. 120	16.25-17.75
No. 123	15.75-17.25
80-10-10 ingot	
No. 305	21.75
No. 315	19.75
88-10-2 ingot	
No. 210	27.75
No. 215	25.25
No. 245	18.25-21.00
Yellow ingot	
No. 405	14.25-16.00
Manganese bronze	
No. 421	20.75

Aluminum Ingot

(Cents per lb, lot of 30,000 lb)

95-5 aluminum-silicon alloys	
0.30 copper, max.	18.50-19.00
0.60 copper, max.	18.25-18.75
Piston alloys (No. 122 type)	16.50-17.00
No. 12 alum. (No. 2 grade)	16.25-16.75
108 alloy	16.75-17.25
195 alloy	17.50-18.00
13 alloy	18.50-19.00
AXS-679	16.75-17.25

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97½%	17.75-18.50
Grade 2—92-95%	16.75-17.50
Grade 3—90-92%	15.75-16.50
Grade 4—85-90%	15.25-15.75

Electroplating Supplies

Anodes

(Cents per lb, freight allowed, in 500 lb lots)

Copper	
Cast, oval, 15 in. or longer	35½
Electrodeposited	29¾
Rolled, oval, straight, delivered	33
Ball anodes	33¾
Brass, 80-20	
Cast, oval, 15 in. or longer	31¼
Zinc, oval, 99.886, f.o.b. Detroit	17¼
Ball anodes	16¾
Nickel 99 pct plus	
Cast	59.00
Rolled, depolarized	60.00
Cadmium	$2.15
Silver 999 fine, rolled, 100 oz lots, per troy oz, f.o.b. Bridgeport, Conn.	79

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	46½
Copper sulfate, 99.5 crystals, bbl	11.10
Nickel salts, single or double, 4-100 lb bags, frt allowed	18.00
Nickel chloride, 300 lb bbl	24.50
Silver cyanide, 100 oz lots, per oz.	59
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc sulfate, 89 pct granular	11.00
Zinc cyanide, 100 lb drums	38.00

Scrap Metals

Brass Mill Scrap

(Cents per pound; add ½¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turnings
Copper	15½	14¾
Yellow brass	12½	11⅝
Red brass	14	13⅛
Commercial bronze	14¼	13½
Manganese bronze	12	11¼
Leaded brass rod ends	12¼	....

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	15.50
No. 2 copper wire	14.50
Light copper	13.50
Refinery brass	13.75*
Radiators	9.75

*Dry copper content.

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to producer)

No. 1 copper wire	15.50
No. 2 copper wire	14.50
Light copper	13.50
No. 1 composition	12.75
No. 1 comp. turnings	12.25
Rolled brass	10.75
Brass pipe	11.00
Radiators	10.00
Heavy yellow brass	9.75
Aluminum	
Mixed old cast	10.00-10.50
Mixed old clips	9.75-10.00
Mixed turnings, dry	7.00- 7.50
Pots and pans	9.75-10.00
Low copper	11.50-12.00

Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 heavy copper and wire	14 —14½
No. 2 heavy copper and wire	13 —13¼
Light copper	11¾—12
Auto radiators (unsweated)	8½— 8¾
No. 1 composition	11 —11¼
No. 1 composition turnings	10½—10⅝
Clean red car boxes	9 — 9¼
Cocks and faucets	9 — 9¼
Mixed heavy yellow brass	7¼ — 7½
Old rolled brass	8½— 8¾
Brass pipe	9¼ — 9½
New soft brass clippings	10½—11
Brass rod ends	9¾—10
No. 1 brass rod turnings	9½— 9¾

Aluminum

Alum. pistons and struts	4½— 5
Aluminum crankcases	7 — 7½
2S aluminum clippings	10½—11
Old sheet and utensils	7 — 7½
Borings and turnings	4
Misc. cast aluminum	7 — 7½
Dural clips (24S)	7 — 7½

Zinc

New zinc clippings	6½— 7
Old zinc	4 — 4½
Zinc routings	2½— 3
Old die cast scrap	3¼— 3½

Nickel and Monel

Pure nickel clippings	21 —23
Clean nickel turnings	14 —15
Nickel anodes	20 —22
Nickel rod ends	20 —22
New Monel clippings	12 —14
Clean Monel turnings	8 — 9
Old sheet Monel	10 —12
Old Monel castings	9 —10
Inconel clippings	11 —13
Nickel silver clippings, mixed	8 —10
Nickel silver turnings, mixed	6 — 7

Lead

Soft scrap, lead	9½— 9¾
Battery plates (dry)	4¼— 4½

Magnesium

Segregated solids	9 —10
Castings	5½— 6½

Miscellaneous

Block tin	60 —62
No. 1 pewter	38 —40
No. 1 auto babbitt	35 —37
Mixed common babbitt	9 — 9¼
Solder joints	11½—12
Siphon tops	40 —42
Small foundry type	11½—12
Monotype	10½—11
Lino. and stereotype	9¾—10¼
Electrotype	8¼— 8½
New type shell cuttings	11½—11¾
Hand picked type shells	4 — 4½
Lino. and stereo. dross	4⅝— 5
Electro. dross	2¾— 3

MARKETS—PRICES—TRENDS

SCRAP
Iron & Steel

Market Remains Firm; Turning Prices Advance

The scrap market gave a slight clue this week as to what may be expected of it during February, providing the coal shortage does not interfere. There has been a little buying at higher prices. The mills have shown some inclination for quality scrap and this has been substantiated by purchases during the past 2 weeks. Last week the price of No. 1 steel advanced $1.00 at Chicago and this week it is up $1.00 at Pittsburgh. Turnings were stronger this week at Pittsburgh, Philadelphia, Youngstown, Cleveland and Cincinnati. This means that more are being used in the blast furnace to make up for a shortage of coke.

Supplies of scrap are reported as ample in dealers' yards. The open weather has helped the movement of material and this has been in favor of the mills. Increased buying by consumers could firm prices in a hurry.

This week there was an increase of $1.00 in the top quotation of No. 1 steel at Pittsburgh, Youngstown and Cleveland. The Pittsburgh advance boosted THE IRON AGE scrap composite 33¢ a ton to $27.08 per gross ton.

PITTSBURGH — The market turned stronger this week. Two sales of No. 1 heavy melting at $31.00 represented an increase of $1.00 on that grade. Brokers were reported freely paying $30.00 to fill old orders at that price. Machine shop turnings were up 50¢, but a sale of short turnings at $25.00 confirmed the current quotation.

CHICAGO — Prices remained substantially unchanged this week as the market continued quiet. Some interest in No. 1 dealers' bundles is being evidenced with standards extremely stiff and inspection rigid. The market for bundles of other grades is practically nonexistent. The trade does not expect any weakness in the market, but does not look for higher prices in the near future in the absence of any substantial mill buying.

PHILADELPHIA—The market limped along without any significant changes last week. Small tonnages of steel grades and breakable cast were placed, in line with the previously quoted prices. The market is generally dull and inactive. There are no transactions reported in some grades, in which quotations must be considered nominal.

NEW YORK—The market here remains quiet with no price changes. Material from this area is still being shipped to Pittsburgh, but very little is going to eastern Pennsylvania. Higher prices are expected during February on the better grades of scrap. The cast grades remain weak with most of the pressure pipe foundries out of the market. The demand for clean cast chemical borings has fallen off and the market is substantially weaker.

DETROIT—The scrap picture here continues to stand still. Local mills are out of the market and prospects for future buying of dealer material are anything but bright, according to dealer sources. With its plants on strike no deliveries of scrap from Chrysler are now possible. Current offers for low phos plate show this material to be less in demand here than No. 1 bundles.

CLEVELAND — Some openhearth and blast furnace grades advanced $1.00 here and in the Valley this week on the basis of broker offers and as the market picked up sympathetic strength from sales in other districts. Scrap is moving freely, so freely in fact that some Valley consumers are scheduling shipments. Closing of the industrial lists has also strengthened the market somewhat, as mill demand is largely for industrial material. Lists are expected to bring about $1.50 more than last time and certainly more than quoted prices. Brokers appraise the present flurry as a short-lived affair, predicting that the market particularly in the dealer grades, with the possible exception of No. 1, will sag after the lists are out.

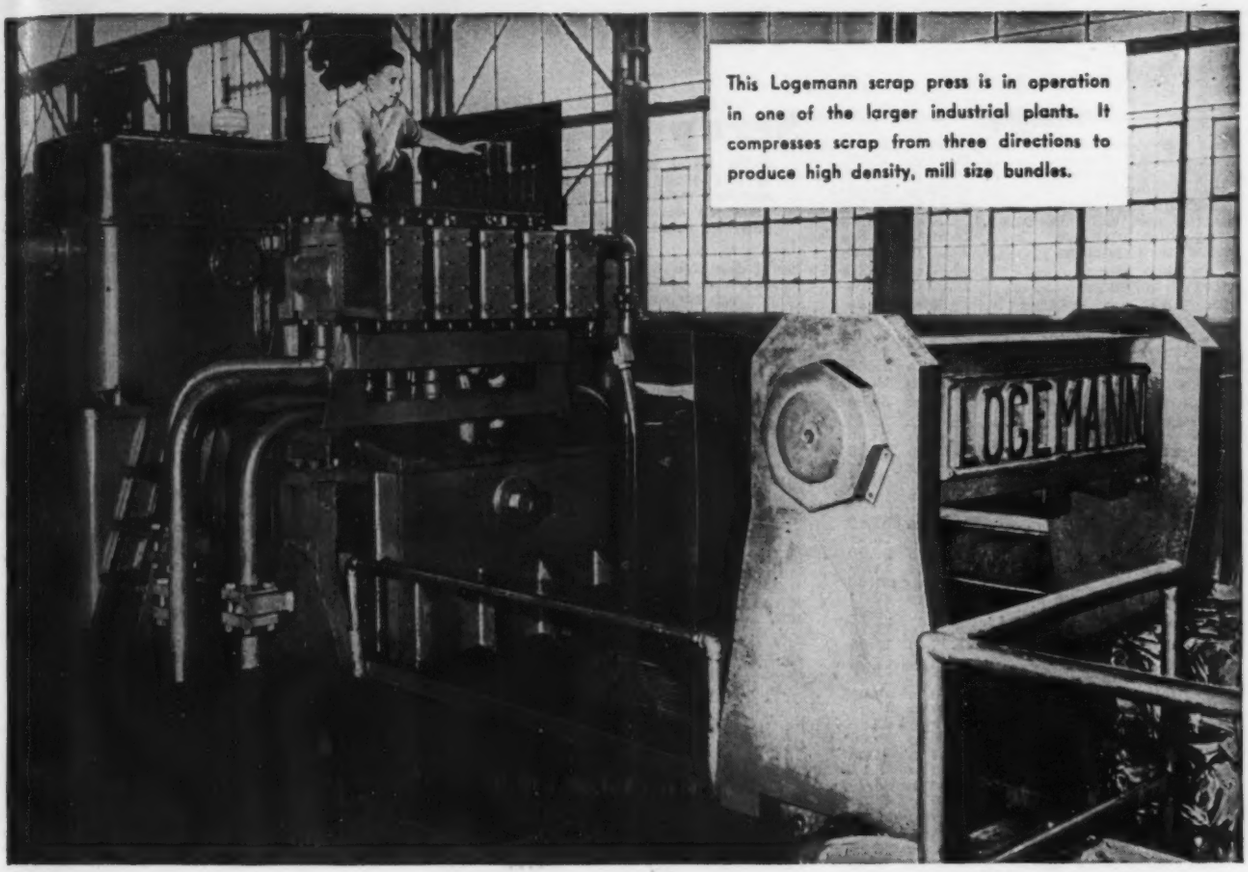
BOSTON—The market here continues weak in the absence of any constructive buying. Some material is moving but not enough for profitable operations. On a few sales No. 2 bundles are up 50¢, being quoted at $14.00 to $14.50. The cast market remains dull after last week's break. No. 2 machinery cast is off $4.50 to $22.00-$22.50.

BUFFALO—Prices slipped an additional 50¢ to $1.00 a ton on cast scrap on sales of limited tonnages. Mixed cupola sold within a range of $32.00-$33.00 while light offerings of No. 1 machinery were placed at $35.00-$36.00. At the same time, a small sale of special No. 1 heavy melting scrap was reported at $1.00 above the prevailing range for regular No. 1 material. The market for steelmaking grades continues to mark time. Prices are unchanged. Leading consumers are still on the sidelines while dealers ship against old orders. Mild open weather has spurred the movement of scrap with dealers showing a willingness to accept new orders at present prices.

CINCINNATI—Aside from No. 1 heavy melting steel, openhearth grades are soft in an inactive market here. A local consumer purchased a representative tonnage of No. 1 at the quoted price late last week, but otherwise trading is at very low ebb. Railroad lists are bringing less than last month, and one major road's No. 1 brought $29.50 last week, or about $1.50 under the last sale. Demand for dealer grades is weak and with the exception of railroad and industrial material, demand exceeds supply by a wide margin. Foundry grades are weak.

ST. LOUIS—With dealers absent because of the Institute meeting last week, the scrap iron market was inactive. Melters in the district are out of the market anyway because of heavy previous commitments and are not expected to make any purchases until about the middle of February.

BIRMINGHAM—The only material moving in this district is on old orders and the purchasers don't want that. Prices for the most part are either nominal or weaker. Republic Steel Corp., largest buyer of scrap in the Birmingham area, is out of the market indefinitely for openhearth grades.



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LOGEMANN BROTHERS COMPANY
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Scrap IRON & STEEL Prices

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$30.50 to $31.00
No. 2 hvy. melting	28.50 to 29.00
No. 1 bundles	30.50 to 31.00
No. 2 bundles	23.50 to 24.00
Machine shop turn.	21.00 to 21.50
Mixed bor. and ms. turns.	21.00 to 21.50
Shoveling turnings	24.50 to 25.00
Cast iron borings	24.50 to 25.00
Low phos. plate	32.00 to 32.50
Heavy turnings	26.00 to 27.00
No. 1 RR. hvy. melting	31.50 to 32.00
Scrap rails, random lgth.	35.50 to 36.50
Rails 2 ft and under	39.00 to 40.00
RR. steel wheels	34.50 to 35.00
RR. spring steel	34.50 to 35.00
RR. couplers and knuckles	34.50 to 35.00
No. 1 machinery cast.	37.00 to 38.00
Mixed yard cast.	34.00 to 35.00
Heavy breakable cast.	29.00 to 30.00
Malleable	33.00 to 34.00

Chicago

No. 1 hvy. melting	$27.00 to $28.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 factory bundles	27.00 to 28.00
No. 1 dealers' bundles	23.00 to 24.00
No. 2 dealers' bundles	20.00 to 21.00
Machine shop turn.	19.00 to 20.00
Mixed bor. and turn.	19.00 to 20.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	18.00 to 19.00
Low phos. forge crops	31.00 to 32.00
Low phos. plate	29.00 to 30.00
No. 1 RR. hvy. melting	29.00 to 30.00
Scrap rails, random lgth.	34.00 to 35.00
Rerolling rails	40.00 to 41.00
Rails 2 ft and under	38.00 to 39.00
Locomotive tires, cut	33.00 to 34.00
Cut bolsters & side frames	34.00 to 35.00
Angles and splice bars	35.00 to 36.00
RR. steel car axles	42.00 to 44.00
RR. couples and knuckles	32.00 to 33.00
No. 1 machinery cast.	38.00 to 39.00
No. 1 agricul. cast.	37.00 to 38.00
Heavy breakable cast.	31.00 to 32.00
RR. grate bars	29.00 to 30.00
Cast iron brake shoes	31.00 to 32.00
Cast iron car wheels	37.00 to 38.00
Malleable	36.00 to 37.00

Philadelphia

No. 1 hvy. melting	$22.50 to $23.50
No. 2 hvy. melting	20.50 to 21.50
No. 1 bundles	22.50 to 23.50
No. 2 bundles	17.50 to 18.50
Machine shop turn.	16.00 to 16.50
Mixed bor. and turn.	14.00 to 15.00
Shoveling turnings	17.00 to 17.50
Low phos. punchings, plate	25.50 to 26.50
Low phos. 5 ft and under	24.50 to 25.50
Low phos. bundles	24.50 to 25.50
Hvy. axle forge turn.	22.50 to 23.50
Clean cast chem. borings	28.00 to 29.00
RR. steel wheels	28.00 to 29.00
RR. spring steel	28.00 to 29.00
Rails 18 in. and under	37.00 to 38.00
No. 1 machinery cast.	36.00 to 38.00
Mixed yard cast.	31.00 to 32.00
Heavy breakable cast.	33.00 to 34.00
Cast iron carwheels	37.00 to 38.00
Malleable	38.00 to 39.00

Cleveland

No. 1 hvy. melting	$28.00 to $28.50
No. 2 hvy. melting	25.50 to 26.00
No. 1 busheling	28.00 to 28.50
No. 1 bundles	28.00 to 28.50
No. 2 bundles	22.50 to 23.00
Machine shop turn.	19.00 to 19.50
Mixed bor. and turn.	20.00 to 20.50
Shoveling turnings	21.00 to 21.50
Cast iron borings	21.00 to 21.50
Low phos. 2 ft and under	29.00 to 29.50
Steel axle turn.	27.00 to 27.50
Drop forge flashings	28.00 to 28.50
No. 1 RR. hvy. melting	31.50 to 32.00
Rails 3 ft and under	42.00 to 43.00
Rails 18 in. and under	43.00 to 44.00
No. 1 machinery cast.	42.00 to 43.00
RR. cast	42.00 to 43.00
RR. grate bars	30.00 to 31.00
Stove plate	34.00 to 35.00
Malleable	38.00 to 39.00

Youngstown

No. 1 hvy. melting	$30.50 to $31.00
No. 2 hvy. melting	27.50 to 28.00
No. 1 bundles	30.50 to 31.00
No. 2 bundles	$24.50 to $25.00
Machine shop turn.	20.50 to 21.00
Shoveling turnings	23.50 to 24.00
Cast iron borings	23.50 to 24.00
Low Phos. plate	31.50 to 32.00

Buffalo

No. 1 hvy. melting	$27.50 to $28.00
No. 2 hvy. melting	25.50 to 26.00
No. 1 busheling	25.50 to 26.00
No. 1 bundles	26.50 to 27.00
No. 2 bundles	24.00 to 24.50
Machine shop turn.	18.00 to 18.50
Mixed bor. and turn	19.00 to 19.50
Shoveling turnings	20.50 to 21.00
Cast iron borings	19.50 to 20.00
Low phos. plate	29.00 to 29.50
Scrap rails, random lgth.	33.50 to 34.00
Rails 2 ft and under	38.50 to 39.00
RR. steel wheels	33.00 to 33.50
RR. spring steel	33.00 to 33.50
RR. couplers and knuckles	33.00 to 33.50
No. 1 machinery cast.	35.00 to 36.00
No. 1 cupola cast.	32.00 to 33.00
Stove plate	32.50 to 33.00
Small indus. malleable	30.00 to 30.50

Birmingham

No. 1 hvy. melting	$25.00
No. 2 hvy. melting	24.00
No. 2 bundles	22.00
No. 1 busheling	24.00
Machine shop turn.	$16.00 to 17.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	19.00
Bar crops and plate	28.00 to 29.00
Structural and plate	28.00 to 29.00
No. 1 RR. hvy. melt.	26.00 to 27.00
Scrap rails, random lgth.	29.00 to 30.00
Rerolling rails	33.00 to 33.50
Rails 2 ft and under	35.50 to 36.00
Angles & splice bars	34.00 to 35.00
Std. steel axles	28.00 to 29.00
No. 1 cupola cast.	35.00 to 36.00
Stove plate	29.00 to 30.00
Cast iron carwheels	28.00 to 29.00

St. Louis

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	25.00 to 26.00
No. 2 bundled sheets	25.00 to 26.00
Machine shop turn.	15.00 to 16.00
Shoveling turnings	19.00 to 20.00
Rails, random lengths	31.00 to 32.00
Rails 3 ft and under	36.00 to 37.00
Locomotive tires, uncut	27.00 to 28.00
Angles and splice bars	34.00 to 35.00
Std. steel car axles	37.00 to 38.00
RR. spring steel	30.00 to 31.00
No. 1 machinery cast.	36.00 to 37.00
Hvy. breakable cast.	30.00 to 31.00
Cast iron brake shoes	27.00 to 28.00
Stove plate	25.00 to 26.00
Cast iron car wheels	34.00 to 35.00
Malleable	28.00 to 30.00

New York

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$19.00 to $19.50
No. 2 hvy. melting	17.50 to 18.00
No. 2 bundles	15.75 to 16.25
Machine shop turn.	10.50 to 11.00
Mixed bor. and turn.	10.50 to 11.00
Shoveling turnings	11.50 to 12.00
Clean cast chem. bor.	23.00 to 24.00
No. 1 machinery cast.	27.50 to 28.50
Mixed yard cast.	26.50 to 27.00
Charging box cast.	26.50 to 27.00
Heavy breakable cast.	26.50 to 27.00
Unstrp. motor blocks	22.00 to 23.00

Boston

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$18.50 to $19.50
No. 2 hvy. melting	16.50 to 17.00
No. 1 bundles	18.50 to 19.50
No. 2 bundles	$14.00 to $14.50
Machine shop turn.	9.50 to 10.00
Mixed bor. and turn.	9.50 to 10.00
Shoveling turnings	12.00 to 12.50
No. 1 busheling	16.50 to 17.00
Clean cast chem. borings	18.00 to 18.50
No. 1 machinery cast.	27.50 to 29.00
No. 2 machinery cast.	22.00 to 22.50
Heavy breakable cast.	22.00 to 23.00
Stove plate	22.00 to 23.00

Detroit

Brokers' buying prices per gross ton, on cars:

No. 1 hvy, melting	$21.00 to $22.00
No. 2 hvy, melting	19.00 to 20.00
No. 1 bundles	23.00 to 24.00
New busheling	22.00 to 23.00
Flashings	22.00 to 23.00
Machine shop turn.	14.00 to 14.50
Mixed bor. and turn.	14.00 to 14.50
Shoveling turnings	15.50 to 16.00
Cast iron borings	15.50 to 16.00
Low phos. plate	22.00 to 23.00
No. 1 cupola cast.	32.00 to 33.00
Heavy breakable cast.	26.00 to 27.00
Stove plate	27.00 to 28.00
Automotive cast.	34.00 to 35.00

Cincinnati

Per gross ton, f.o.b. cars:

No. 1 hvy. melting	$25.50 to $26.00
No. 2 hvy. melting	21.50 to 22.00
No. 1 bundles	25.50 to 26.00
No. 2 bundles	17.50 to 18.00
Machine shop turn.	12.50 to 13.00
Mixed bor. and turn.	13.50 to 14.00
Shoveling turnings	15.50 to 16.00
Cast iron borings	15.50 to 16.00
Low phos. 18 in. under	32.00 to 32.50
Rails, random lengths	32.00 to 33.00
Rails, 18 in. and under	40.00 to 41.00
No. 1 cupola cast	35.00 to 36.00
Hvy. breakable cast	31.00 to 32.00
Drop broken cast	40.00 to 41.00

San Francisco

No. 1 hvy. melting		$20.00
No. 2 hvy. melting		18.00
No. 1 bundles		16.00
No. 2 bundles		16.00
No. 3 bundles		13.00
Machine shop turn		9.00
Elec. fur. 1 ft and under		28.00
No. 1 RR. hvy. melting		20.00
Scrap rails, random lgth.		20.00
No. 1 cupola cast.		$30.00 to 33.00

Los Angeles

No. 1 hvy. melting		$20.00
No. 2 hvy. melting		18.00
No. 1 bundles		16.00
No. 2 bundles		16.00
No. 3 bundles		13.00
Mach. shop turn.		12.00
Elec. fur. 1 ft and under		30.00
No. 1 RR. hvy. melting		20.00
No. 1 cupola cast.		$34.50 to 37.00

Seattle

No. 1 hvy. melting		$18.00
No. 2 hvy. melting		18.00
No. 1 bundles		16.00
No. 2 bundles		16.00
No. 3 bundles		12.00
Elec. fur. 1 ft and under		$25.00 to 28.00
RR. hvy. melting		19.00
No. 1 cupola cast		30.00
Heavy breakable cast.		20.00

Hamilton, Ont.

No. 1 hvy. melting		$24.00
No. 1 bundles		16.00
No. 2 bundles		16.00
Mechanical bundles		22.00
Mixed steel scrap		20.00
Mixed bor. and turn.		18.00
Rails, remelting		24.00
Rails, rerolling		27.00
Bushelings		18.50
Bush., new fact, prep'd		22.00
Bush., new fact, unprep'd		17.00
Short steel turnings		18.00
Cast scrap		$40.00 to 43.00

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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Comparison of Prices

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel: (cents per pound)	Jan. 31, 1950	Jan. 24, 1950	Jan. 3, 1950	Feb. 1, 1949
Hot-rolled sheets	3.35	3.35	3.35	3.26
Cold-rolled sheets	4.10	4.10	4.10	4.00
Galvanized sheets (10 ga)	4.40	4.40	4.40	4.40
Hot-rolled strip	3.25	3.25	3.25	3.265
Cold-rolled strip	4.21	4.21	4.21	4.063
Plates	3.50	3.50	3.50	3.42
Plates wrought iron	7.85	7.85	7.85	7.85
Stains C-R strip (No. 302)	33.00	33.00	33.00	33.25
Tin and Terneplate: (dollars per base box)				
Tinplate (1.50 lb) cokes	$7.50	$7.50	$7.50	$7.75
Tinplate, electro (0.50 lb)	6.60	6.60	6.60	6.70
Special coated mfg. ternes	6.50	6.50	6.50	6.65
Bars and Shapes: (cents per pound)				
Merchant bars	3.45	3.45	3.45	3.37
Cold-finished bars	4.145*	4.145*	4.145*	3.995
Alloy bars	3.95	3.95	3.95	3.75
Structural shapes	3.40	3.40	3.40	3.25
Stainless bars (No. 302)	28.50	28.50	28.50	28.50
Wrought iron bars	9.50	9.50	9.50	9.50
Wire: (cents per pound)				
Bright wire	4.50	4.50	4.50	4.256
Rails: (dollars per 100 lb)				
Heavy rails	$3.40	$3.40	$3.40	$3.20
Light rails	3.75	3.75	3.75	3.55
Semifinished Steel: (dollars per net ton)				
Rerolling billets	$54.00	$54.00	$54.00	$52.00
Slabs, rerolling	54.00	54.00	54.00	52.00
Forging billets	63.00	63.00	63.00	61.00
Alloy blooms, billets, slabs	66.00	66.00	66.00	63.00
Wire Rod and Skelp: (cents per pound)				
Wire rods	3.85	3.85	3.85	3.619
Skelp	3.15	3.15	3.15	3.25

* Revised

Prices advances over previous week are printed in Heavy Type; declines appear in *Italics*.

Pig Iron: (per gross ton)	Jan. 31, 1950	Jan. 24, 1950	Jan. 3, 1950	Feb. 1, 1949
No. 2, foundry, Phila.	$50.42	$50.42	$50.42	$51.56
No. 2, Valley furnace	46.50	46.50	46.50	46.50
No. 2, Southern Cin'ti	47.08	47.08	46.08	49.46
No. 2, Birmingham	40.38	40.38	39.38	43.38
No. 2, foundry, Chicago†	46.50	46.50	46.50	46.50
Basic del'd Philadelphia	49.92	49.92	49.92	50.76
Basic, Valley furnace	46.00	46.00	46.00	46.00
Malleable, Chicago†	46.50	46.50	46.50	46.50
Malleable, Valley	46.50	46.50	46.50	46.50
Charcoal, Chicago	68.56	68.56	68.56	73.78
Ferromanganese‡	173.40	173.40	173.40	161.40

†The switching charge for delivery to foundries in the Chicago district is $1 per ton.
‡Average of U. S. prices quoted on Ferroalloy page.

Scrap: (per gross tons)				
Heavy melt'g steel, P'gh.	$30.75	$29.75	$29.75	$40.75
Heavy melt'g steel, Phila.	23.00	23.00	23.50	41.50
Heavy melt'g steel, Ch'go	27.50	27.50	25.50	39.00
No. 1 hy. com. sh't, Det.	23.50	23.50	24.50	33.50
Low phos. Young'n	31.75	30.75	31.75	45.25
No. 1, cast, Pittsburgh	37.50	37.50	37.50	58.50
No. 1, cast, Philadelphia	37.00	37.00	37.00	49.00
No. 1, cast, Chicago	38.50	38.50	38.50	51.00
Coke: Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.00	$14.00	$14.00	$15.25
Foundry coke, prompt	15.75	15.75	15.75	16.75
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro, Conn.	18.50	18.50	18.50	23.50
Copper, Lake Conn.	18.625	18.625	18.625	23.625
Tin Straits, New York	*74.50*	75.50	77.50	$1.03
Zinc, East St. Louis	9.75	9.75	9.875	17.50
Lead, St. Louis	11.80	11.80	11.80	21.30
Aluminum, virgin	17.00	17.00	17.00	17.00
Nickel electrolytic	42.97	42.97	42.97	42.90
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	28.75	28.75	32.00	38.50

Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 139 of May 12, 1949, issue.)

Composite Prices

	Finished Steel Base Price	Pig Iron	Scrap Steel
Jan. 31, 1950	3.837¢ per lb.	$46.05 per gross ton	$27.08 per gross ton
One week ago	3.837¢ per lb.	46.05 per gross ton	26.75 per gross ton
One month ago	3.837¢ per lb.	45.88 per gross ton	26.25 per gross ton
One year ago	3.720¢ per lb.	46.82 per gross ton	40.42 per gross ton

	High	Low	High	Low	High	Low
1950	3.837¢ Jan. 3	3.837¢ Jan. 3	$46.05 Jan. 17	$45.88 Jan. 3	$27.08 Jan. 31	$26.25 Jan. 3
1949	3.837¢ Dec. 27	3.705¢ May 3	46.87 Jan. 18	45.88 Sept. 6	43.00 Jan. 4	19.33 June 28
1948	3.721¢ July 27	3.193¢ Jan. 1	46.91 Oct. 12	39.58 Jan. 6	43.16 July 27	39.75 Mar. 9
1947	3.193¢ July 29	2.848¢ Jan. 1	37.98 Dec. 30	30.14 Jan. 7	42.58 Oct. 28	29.50 May 20
1946	2.848¢ Dec. 31	2.464¢ Jan. 1	30.14 Dec. 10	25.37 Jan. 1	31.17 Dec. 24	19.17 Jan. 1
1945	2.464¢ May 29	2.396¢ Jan. 1	25.37 Oct. 23	23.61 Jan. 2	19.17 Jan. 2	18.92 May 22
1944	2.396¢	2.396¢	$23.61	$23.61	19.17 Jan. 11	15.76 Oct. 24
1943	2.396¢	2.396¢	23.61	23.61	$19.17	$19.17
1942	2.396¢	2.396¢	23.61	23.61	19.17	19.17
1941	2.396¢	2.396¢	$23.61 Mar. 20	$23.45 Jan. 2	$22.00 Jan. 7	$19.17 Apr. 10
1940	2.30467¢ Jan. 2	2.24107¢ Apr. 16	23.45 Dec. 23	22.61 Jan. 2	21.83 Dec. 30	16.04 Apr. 9
1939	2.35367¢ Jan. 3	2.26689¢ May 16	22.61 Sept. 19	20.61 Sept. 12	22.50 Oct. 3	14.08 May 16
1938	2.58414¢ Jan. 4	2.27207¢ Oct. 18	23.25 June 21	19.61 July 6	15.00 Nov. 22	11.00 June 7
1937	2.58414¢ Mar. 9	2.32263¢ Jan. 4	23.25 Mar. 9	20.25 Feb. 16	21.92 Mar. 30	12.67 June 9
1936	2.32263¢ Dec. 28	2.05200¢ Mar. 10	19.74 Nov. 24	18.73 Aug. 11	17.75 Dec. 21	12.67 June 8
1935	2.07642¢ Oct. 1	2.06492¢ Jan. 8	18.84 Nov. 5	17.83 May 14	13.42 Dec. 10	10.33 Apr. 29
1932	1.89196¢ July 5	1.83901¢ Mar. 1	14.81 Jan. 5	13.56 Dec. 6	8.50 Jan. 12	6.43 July 5
1929	2.31773¢ May 28	2.26498¢ Oct. 29	18.71 May 14	18.21 Dec. 17	17.58 Jan. 29	14.08 Dec. 8

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing major portion of finished steel shipments. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

SCRAP

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STEEL PRICES

Smaller numbers in price boxes indicate producing companies. For main office locations, see key on facing page.
Base prices at producing points apply only to sizes and grades produced in those areas. Prices are in cents per lb unless otherwise noted. Extras apply

	Pittsburgh	Chicago	Gary	Cleveland	Canton Massillon	Middletown	Youngstown	Bethlehem	Buffalo	Conshohocken	Johnstown	Sparrows Point	Granite City	Detroit
INGOTS Carbon forging, net ton	$50.00 1													$50.00 31
Alloy net ton	$51.00 1.17													$51.00 31
BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton	$53.00 1	$53.00 1	$53.00 1				$57.00 18		$53.00 3	$58.00 26	$53.00 3			
Carbon forging billets, net ton	$63.00 1	$63.00 1.4	$63.00 1.8	$63.00 4			$63.00 25		$63.00 3.4	$65.00 26	$63.00 3			$63.00 31
Alloy, net ton	$66.00 1.17	$66.00 1.4	$66.00 1		$66.00 4.42		$66.00 12	$66.00 3	$66.00 3.4	$68.00 26	$66.00 3			$68.00 31
SHEET BARS							$57.00 18							
PIPE SKELP	3.15 1.5						3.15 1.4							
WIRE RODS	3.85 2.18	3.85 2.4.33	3.85 6	3.85 2			3.85 6				3.85 3	3.95 3		
SHEETS Hot-rolled (18 ga. & hvr.)	3.35 1.5.9.15	3.35 23	3.35 1.6.8	3.35 4.5			3.35 1.4.6.13		3.35 3	3.45 26		3.35 2		3.55 12
Cold-rolled	4.10[1.5] 7.9.15.63		4.10 1.6.8	4.10 4.15		4.10 7	4.10 4.6		4.10 3			4.10 3	4.30 22	4.30 12
Galvanized (10 gage)	4.40 1.9.15		4.40 1.8		4.40 4		4.65[24] 4.75[44]					4.40 3		
Enameling (12 gage)	4.40 1		4.40 1.8	4.40 4		4.40 7	4.40[6] 4.90[76]						4.60 22	4.70 12
Long ternes (10 gage)	4.80 9.15		4.80 1			4.80 7	4.80 64							
Hi Str. low alloy, h.r.	5.05 1.5.9	5.05 1	5.05 1.6.8	5.05 4.5			5.05 1.4.6.13		5.05 3	5.05 26		5.05 3		5.25 12
Hi Str. low alloy, c.r.	6.20 1.5.9		6.20 1.6.8	6.20 4.5			6.20 4.6.13		6.20 3			6.20 3		6.40 12
Hi Str. low alloy, galv.	6.75 1			6.75 4	6.75 4							6.75 3		
STRIP Hot-rolled (over 6 in.)	3.25 5.7.9.28	3.25 3.66	3.25 1.6.8	3.25 5			3.25 1.4.6.13		3.25 3	3.35 26		3.25 3		3.45 12.47
Cold-rolled	4.15 5.7.9.63	4.30 8.66	4.30 8	4.15 2.5		4.15 7	4.15 4.6.13.40.48.49		4.15 2			4.15 3		4.40[68.81] 4.35[12.47]
Hi Str. low alloy, h.r.	4.95 9		4.95 1.6.8	4.95 5			4.95 1.4.6.13		4.95 3	4.95 26		4.95 3		5.15 12
Hi Str. low alloy, c.r.	6.20 9			6.20 2.5			6.20 4.6.13		6.20 3			6.20 3		6.40 12
TINPLATE† Cokes, 1.50-lb. base box 1.25 lb, deduct 20¢	$7.50 1.5.9.15		$7.50 1.6.8				$7.50 4					$7.60 3	$7.70 22	
Electrolytic 0.25, 0.50, 0.75 lb box	Deduct $1.15, 90¢ and 65¢ respectively from 1.50-lb coke base box price													
BLACKPLATE, 29 gage Hollowware enameling	5.30 1.5.15		5.30 1.6				5.30 4					5.40 3	5.60 22	
BARS Carbon steel	3.45 1.5.9.17	3.45 1.4.23	3.45 1.6.8	3.45 4	3.45 4		3.45 1.4.6		3.45 3.4		3.45 3			3.65 12
Reinforcing‡	3.45 1.5	3.45 4	3.45 1.6.8	3.45 4	3.45 4		3.45 1.4.6		3.45 3.4		3.45 3	3.45 3		
Cold-finished	4.10[5] 4.15[2.4] 17.52.69.71	4.15[3] 23.69.70	4.15 4.73.74	4.15 2.61	4.15 4.32.82		4.15 6.40.57		4.15 70					4.45 12
Alloy, hot-rolled	3.95 1.17	3.95 1.4.23	3.95 1.6.8		3.95 4		3.95 1.6.25	3.95 3	3.95 3.4		3.95 3			4.25 12
Alloy, cold-drawn	4.90 2.17.52.69.71	4.90 2.23.69.70	4.90 4.73.74	4.90 2.61	4.90 4.42.82		4.90 6.25.57	4.90 3	4.90 3.70					
Hi Str. low alloy, h.r.	5.20 1.5		5.20 1.6.8	5.20 4			5.20 1.6	5.20 3	5.20 3		5.20 3			5.40 12
PLATE Carbon Steel	3.50 1.5	3.50 1	3.50 1.6.8	3.50 4			3.50 1.13		3.50 3	3.60 26	3.50 3	3.50 3		3.75 12
Floor plates	4.55 1	4.55 1	4.55 3	4.55 5						4.55 26				
Alloy	4.40 1	4.40 1	4.40 1				4.40 13			4.40 26	4.40 3	4.40 3		
Hi Str. low alloy	5.35 1.5	5.35 1	5.35 1.3	5.535 4.5			5.35 6			5.35 26	5.35 3	5.35 3		5.60 12
SHAPES, Structural	3.40 1.5.9	3.40 1.23	3.40 1.6.8					3.45 3	3.45 3		3.45 3			
Hi Str. low alloy	5.15 1.5	5.15 1	5.15 1.6.8				5.15 6	5.15 3	5.15 3		5.15 3			
MANUFACTURERS' WIRE Bright	4.50 2.5.18	4.50[2] 4.12.33.34		4.50 2.77			4.50 6	Kokomo = 4.60[3.9]			4.50 3	4.60 3	Duluth = 4.50[2] Pueblo = 4.75[14]	
PILING, Steel sheet	4.20[1] 4.05[9]	4.20 1							4.20 3					

STEEL PRICES

Smaller numbers indicate producing companies. See key at right. Prices are in cents per lb unless otherwise noted. Extras apply.

Kansas City	Houston	Birmingham	WEST COAST Seattle, San Francisco, Los Angeles, Fontana		
					INGOTS Carbon forging, net ton
	$59.00 83				Alloy, net ton
		$53.00 11	F=$72.00[19]		BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton
	$71.00 83	$63.00 11	F=$82.00[19]	Geneva=$61.00[16]	Carbon forging billets, net ton
	$74.00 83		F=$82.00[19]		Alloy net ton
				Portsmouth=$55.00[20]	SHEET BARS
					PIPE SKELP
	4.25 83	3.85 11	SF=4.50[24], LA=4.65[24] LA=4.20[82]	Portsmouth=3.85[20] Worcester=4.15[3]	WIRE RODS
		3.35 4-11	SF, LA=4.05[24] F=4.25[19]	Ashland[7]=3.35 Niles=3.50[64]	SHEETS Hot-rolled (18 ga. & hvr.)
		4.10 11	SF=5.05[24] F=5.00[19]		Cold-rolled
		4.40 4-11	SF, LA=5.15[24]	Ashland=4.40[7] Kokomo=4.50[30]	Galvanized (10 gage)
					Enameling (12 gage)
					Long ternes (10 gage)
		5.05 11	F=6.74[19]		Hi Str. low alloy, h.r.
			F=7.05[19]		Hi Str. low alloy, c.r.
					Hi Str. low alloy, galv.
3.85 83	3.85 83	3.25 11	SF, LA=4.00[24,62] F=4.40[19] S=4.25[62]	Ashland=3.25[7] Atlanta=3.40[65]	STRIP Hot-rolled
			F=5.40[19] LA=5.50[27]	New Haven=4.85[2,68]	Cold-rolled
		4.95 11	F=6.64[19]		Hi Str. low alloy, h.r.
			F=6.95[19]		Hi Str. low alloy c.r.
		$7.60 11	SF=$8.25[24]		TINPLATE Cokes, 1.50-lb base box 1.25 lb, deduct 20¢
Deduct $1.15, 90¢ and 65¢ respectively from 1.50-lb coke base box price					Electrolytic 0.25, 0.50, 0.75 lb box
					BLACKPLATE, 29 gage Hollowware enameling
4.05 83	3.85 83	3.45 4-11	SF, LA=4.15[24] LA=4.15[82]	Atlanta=3.60[65]	BARS Carbon steel
4.05 83	3.85 83	3.45 4-11	SF, S=4.20[82] F=4.10[19]	Atlanta=3.60[65]	Reinforcing‡
				Putnam, Newark=4.55[69]	Cold-finished
4.55 83	4.35 83		LA=5.00[82] F=4.95[19]		Alloy, hot-rolled
				Newark,[69] Worcester[3]=5.20 Hartford=5.20[4]	Alloy, cold-drawn
		5.20 4-11	F=6.25[19]		Hi Str. low alloy, h.r.
	3.90 83	3.50 4-11	F=4.10[19] S=4.40[82] Geneva=3.50[16]	Claymont=3.60[29] Coatesville=3.60[21] Harrisburg=3.50[35]	PLATE Carbon steel
				Harrisburg=4.55[35]	Floor plates
			F=5.40[19]	Coatesville=4.50[21]	Alloy
		5.35 11	F=5.95[19]	Geneva=5.35[16]	Hi Str. low alloy
4.00 83	3.80 83	3.40 11	SF=3.95[62] LA=4.00[24,62]	Phoenixville=3.30[56] Geneva=3.40[16]	SHAPES, Structural
		5.15 11	F=4.00[19] S=4.05[62]	Fontana=5.75[19] Geneva=5.51[16]	Hi Str. low alloy
5.10 83	4.90 83	4.50 4-11	SF, LA=5.45[24] LA=5.10[82]	Portsmouth=4.50[20] Worcester=4.80[3]	MANUFACTURERS' WIRE Bright

Notes: †Special coated mfg ternes, deduct $1.00 from 1.50-lb coke base box price. Can-making quality blackplate, 55 to 128-lb, deduct $1.90 from 1.50-lb coke base box. ‡Straight lengths only from producer to fabricator.

KEY TO STEEL PRODUCERS

With Principal Offices

1 Carnegie-Illinois Steel Corp., Pittsburgh
2 American Steel & Wire Co., Cleveland
3 Bethlehem Steel Co., Bethlehem
4 Republic Steel Corp., Cleveland
5 Jones & Laughlin Steel Corp., Pittsburgh
6 Youngstown Sheet & Tube Co., Youngstown
7 Armco Steel Corp., Middletown, Ohio
8 Inland Steel Co., Chicago
9 Weirton Steel Co., Weirton, W. Va.
10 National Tube Co., Pittsburgh
11 Tennessee Coal, Iron & R. R. Co., Birmingham
12 Great Lakes Steel Corp., Detroit
13 Sharon Steel Corp., Sharon, Pa.
14 Colorado Fuel & Iron Corp., Denver
15 Wheeling Steel Corp., Wheeling, W. Va.
16 Geneva Steel Co., Salt Lake City
17 Crucible Steel Co. of America, New York
18 Pittsburgh Steel Co., Pittsburgh
19 Kaiser Co., Inc., Oakland, Calif.
20 Portsmouth Steel Corp., Portsmouth, Ohio
21 Lukens Steel Co., Coatesville, Pa.
22 Granite City Steel Co., Granite City, Ill.
23 Wisconsin Steel Co., South Chicago, Ill.
24 Columbia Steel Co., San Francisco
25 Copperweld Steel Co., Glassport, Pa.
26 Alan Wood Steel Co., Conshohocken, Pa.
27 Calif. Cold Rolled Steel Corp., Los Angeles
28 Allegheny Ludlum Steel Corp., Pittsburgh
29 Worth Steel Co., Claymont, Del.
30 Continental Steel Corp., Kokomo, Ind.
31 Rotary Electric Steel Co., Detroit
32 Laclede Steel Co., St. Louis
33 Northwestern Steel & Wire Co., Sterling, Ill.
34 Keystone Steel & Wire Co., Peoria, Ill.
35 Central Iron & Steel Co., Harrisburg, Pa.
36 Carpenter Steel Co., Reading, Pa.
37 Eastern Stainless Steel Corp., Baltimore
38 Washington Steel Corp., Washington, Pa.
39 Jessop Steel Co., Washington, Pa.
40 Blair Strip Steel Co., New Castle, Pa.
41 Superior Steel Corp., Carnegie, Pa.
42 Timken Steel & Tube Div., Canton, Ohio
43 Babcock & Wilcox Tube Co., Beaver Falls, Pa.
44 Reeves Steel & Mfg. Co., Dover, Ohio
45 John A. Roebling's Sons Co., Trenton, N. J.
46 Simonds Saw & Steel Co., Fitchburg, Mass.
47 McLouth Steel Corp., Detroit
48 Cold Metal Products Co., Youngstown
49 Thomas Steel Co., Warren, Ohio
50 Wilson Steel & Wire Co., Chicago
51 Sweet's Steel Co., Williamsport, Pa.
52 Superior Drawn Steel Co., Monaca, Pa.
53 Tremont Nail Co., Wareham, Mass.
54 Firth Sterling Steel & Carbide Corp., McKeesport, Pa.
55 Ingersoll Steel Div., Chicago
56 Phoenix Iron & Steel Co., Phoenixville, Pa.
57 Fitzsimmons Steel Co., Youngstown
58 Stanley Works, New Britain, Conn.
59 Universal-Cyclops Steel Corp., Bridgeville, Pa.
60 American Cladmetals Co., Carnegie, Pa.
61 Cuyahoga Steel & Wire Co., Cleveland
62 Bethlehem Pacific Coast Steel Corp., San Francisco
63 Follansbee Steel Corp., Pittsburgh
64 Niles Rolling Mill Co., Niles, Ohio
65 Atlantic Steel Co., Atlanta
66 Acme Steel Co., Chicago
67 Joslyn Mfg. & Supply Co., Chicago
68 Detroit Steel Corp., Detroit
69 Wyckoff Steel Co., Pittsburgh
70 Bliss & Laughlin, Inc., Harvey, Ill.
71 Columbia Steel & Shafting Co., Pittsburgh
72 Cumberland Steel Co., Cumberland, Md.
73 La Salle Steel Co., Chicago
74 Monarch Steel Co., Inc., Indianapolis
75 Empire Steel Co., Mansfield, Ohio
76 Mahoning Valley Steel Co., Niles, Ohio
77 Oliver Iron & Steel Co., Pittsburgh
78 Pittsburgh Screw & Bolt Co., Pittsburgh
79 Standard Forgings Corp., Chicago
80 Driver Harris Co., Harrison, N. J.
81 Detroit Tube & Steel Div., Detroit
82 Reliance Div., Eaton Mfg. Co., Massillon, Ohio
83 Sheffield Steel Corp., Kansas City

MERCHANT WIRE PRODUCTS

To the dealer, f.o.b. mill

	Base Column	Pittsburg, Calif.
Standard & coated nails*	106	125§
Woven wire fence†	116	139
Fence posts, carloads††	112	...
Single loop bale ties	113	137
Galvanized barbed wire**	126	146
Twisted barbless wire	126	146

* Pgh., Chi., Duluth; Worcester, 6 columns higher; Houston, 8 columns higher; Kansas City, 12 columns higher. † 15½ gage and heavier. ** On 80 rod spools, in carloads. †† Duluth, Joliet and Johnstown.

	Base per 100 lb	Pittsburg, Calif.
Merch. wire, annealed‡	$5.35	$6.30
Merch. wire, galv.‡	5.60	6.55
Cut nails, carloads‡‡	6.75	...

‡ Add 30¢ at Worcester; 20¢ at Chicago; 10¢ at Sparrows Pt.
‡‡ Less 20¢ to jobbers.
§ Torrance, 126.

PRODUCING POINTS — *Standard, Coated or galvanized nails, woven wire fence, bale ties, and barbed wire:* Alabama City, Ala., 4; Atlanta, 65; Aliquippa, Pa. (except bale ties), 5; Bartonville, Ill. (except bale ties), 34; Chicago, 4; Donora, Pa., 2; Duluth, 2; Fairfield, Ala., 11; Johnstown, Pa. (except bale ties), 3; Joliet, Ill., 2; Kokomo, Ind., 30; Minnequa, Colo., 14; Monessen, Pa. (except bale ties), 18; Pittsburg, Calif., 24; Portsmouth, Ohio, 20; Rankin, Pa. (except bale ties), 2; Sparrows Point (except woven fence), 3; Sterling, Ill., 33; San Francisco (except nails and woven fence), 14; Torrance, Calif. (nails only), 24; Worcester (nails only), 2; Houston (except bale ties), 83; Kansas City, 83.

Fence posts: Duluth, 2; Johnstown, Pa., 3; Joliet, Ill., 2; Minnequa, Colo., 14; Moline, Ill., 4; Williamsport, Pa., 51.

Cut nails: Wheeling, W. Va., 15; Conshohocken, Pa., 26; Warehame, Mass., 53.

CLAD STEEL

Base prices, cents per pound, f.o.b. mill

Stainless-carbon	Plate	Sheet
No. 304, 20 pct,		
Coatesville, Pa. (21)	*26.50	
Washgtn, Pa. (39)	*26.50	
Claymont, Del. (29)	*26.50	
Conshohocken, Pa. (26)		*22.50
New Castle, Ind. (55)	*26.50	*24.00
Nickel-carbon		
10 pct, Coatesville (26)	27.50	
Inconel-carbon		
10 pct, Coatesville (21)	36.00	
Monel-carbon		
10 pct, Coatesville (21)	29.00	
No. 302 Stainless-copper-stainless, Carnegie, Pa. (60)		75.00
Aluminized steel sheets, hot dip, Butler, Pa. (7)		7.75

* Includes annealing and pickling, or sandblasting.

ELECTRICAL SHEETS

22 gage, HR cut lengths, f.o.b. mill

	Cents per lb
Armature	†6.45
Electrical	†*6.95
Motor	*7.95
Dynamo	8.75
Transformer 72	9.30
Transformer 65	9.85
Transformer 58	10.55
Transformer 52	11.35

PRODUCING POINTS—Beech bottom, W. Va., 18; Brackenridge, Pa., 28; Follansbee, W. Va., 63; Granite City, Ill., 22*, add 20¢; Indiana Harbor, Ind., 8†, deduct 25¢; Mansfield, Ohio, 75; Niles, Ohio, 64, 76; Vandergrift, Pa., 1; Warren, Ohio, 4; Zanesville, Ohio, 7†, deduct 25¢.

Numbers after producing points correspond to steel producers. See key on Steel Price page.

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts f.o.b. mill Pittsburgh, Cleveland, Birmingham or Chicago)
Base discount

Machine and Carriage Bolts

	Pct Off List Less Case	C.
½ in. & smaller x 6 in. & shorter	27	38
9/16 & ⅝ in. x 6 in. & shorter	29	40
¾ in. & larger x 6 in. shorter	26	37
All diam., longer than 6 in.	22	34
Lag, all diam over 6 in. & longer	28	39
Lag, all diam x 6 in. & shorter	30	41
Plow bolts	40	—

Nuts, Cold Punched or Hot Pressed

(Hexagon or Square)

	Pct Off List
½ in. and smaller	25 37
9/16 and ⅝ in.	23 35
¾ to 1½ in. inclusive	23 35
1⅝ in. and larger	16 29

Semifinished Hexagon Nuts

(Less case lots)

	Pct Off List Reg	Hvy	Lt
½ in. and smaller	41	35	41
9/16 & ⅝ in.	36	30	36
¾ to 1½ in.	31	27	33
1⅝ in. and larger	21	17	..

In full case lots, 15 pct additional discount.

Stove Bolts

Pct Off List

Packaged, steel, plain finish 63½ and 10
Packaged, plated finish 50 and 10
Bulk, plain finish** 72*

*Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.

**Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Large Rivets

(½ in. and larger)
Base per 100 lb

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham, Lebanon, Pa. $7.25

Small Rivets

(7/16 in. and smaller)
Pct Off List

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham 43

Cap and Set Screws

(In bulk) *Pct Off List*

Hexagon head cap screws, coarse or fine thread, ¼ in. thru ⅝ in. x 6 in., SAE 1020, bright	60
¼ in. through ⅝ in. x 6 in. and shorter (SAE 1035) heat treated	54
Milled studs	28
Flat head cap screws, listed sizes	24
Fillister head cap, listed sizes	43

C-R SPRING STEEL

Base per pound f.o.b. mill

0.26 to 0.40 carbon	4.15¢
0.41 to 0.60 carbon	5.95¢
0.61 to 0.80 carbon	6.55¢
0.81 to 1.05 carbon	8.50¢
1.06 to 1.35 carbon	10.80¢

Worcester, add 0.30¢.

LAKE SUPERIOR ORES

(51.50% Fe; natural content, delivered lower lake ports)

	Per gross ton
Old range, bessemer	$8.10
Old range, nonbessemer	7.95
Mesabi, bessemer	7.85
Mesabi, nonbessemer	7.70
High phosphorus	7.70

After Dec. 31, 1948, increases or decreases in Upper Lake freight, dock and handling charges and taxes thereon to be for the buyers' account.

RAILS, TRACK SUPPLIES

F.o.b. mill

Standard rails, 100 lb and heavier, No. 1 quality, per 100 lb	$3.40
Joint bars, per 100 lb	4.40
Light rails, per 100 lb	3.75

	Base Price cents per lb
Track spikes†	5.60
Axles	5.25
Screw spikes	8.60
Tie plates	4.20
Tie plates, Pittsburgh, Torr., Calif.*	4.35
Track bolts, untreated	8.85
Track bolts, heat treated, to railroads	9.10

* Seattle, add 30¢.
† Kansas City, 5.85¢.

PRODUCING POINTS—*Standard rails:* Bessemer, Pa., 1; Ensley, Ala., 11; Gary, 1; Indiana Harbor, Ind., 8; Lackawanna, N. Y., 3; Minnequa, Colo., 14; Steelton, Pa., 3.

Light rails: All the above except Indiana Harbor and Steelton, plus Fairfield, Ala., 11; Johnstown, Pa., 3; Minnequa, Colo., 14.

Joint bars: Bessemer, Pa., 1; Fairfield, Ala., 11; Indiana Harbor, Ind., 8; Joliet, Ill., 1; Lackawanna, N. Y., 3; Steelton, Pa., 3; Minnequa, Colo., 14.

Track spikes: Fairfield, Ala., 11; Indiana Harbor, Ind., 6, 8; Lebanon, Pa., 3; Minnequa, Colo., 14; Pittsburgh, 5; Chicago, 4; Struthers, Ohio, 6; Youngstown, 4.

Track bolts: Fairfield, Ala., 11; Lebanon, Pa., 3; Minnequa, Colo., 14; Pittsburgh, 77, 78.

Axles: Fairfield, Ala., 11; Gary, 1; Indiana Harbor, Ind., 79; Johnstown, Pa., 3; McKees Rocks, Pa., 1.

Tie plates: Fairfield, Ala., 11; Gary, 1; Indiana Harbor, Ind., 8; Lackawanna, N. Y., 3; Pittsburg, Calif., 24; Pittsburgh, 4; Seattle, 62; Steelton, Pa., 3; Torrance, Calif., 24; Minnequa, Colo., 14.

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	$1.00
18	4	1	—	5	$1.565
18	4	2	—	—	$1.13
1.5	4	1.5	8	—	71.5¢
6	4	2	6	—	76.5¢

High-carbon-chromium	57.5¢
Oil hardened manganese	32¢
Special carbon	29.5¢
Extra carbon	24.5¢
Regular carbon	21¢

Warehouse prices on and east of Mississippi are 2½¢ per lb higher. West of Mississippi, 4½¢ higher.

COKE

	Net Ton
Furnace, beehive (f.o.b. oven) Connellsville, Pa.	$13.50 to $14.50
Foundry, beehive (f.o.b. oven) Connellsville, Pa.	$15.50 to $16.00
Foundry, oven coke	
Buffalo, del'd	$20.90
Chicago, f.o.b.	20.40
Detroit, f.o.b.	19.40
New England, del'd	22.70
Seaboard, N. J., f.o.b.	22.00
Philadelphia, f.o.b.	20.45
Swedeland, Pa., f.o.b.	20.40
Plainesville, Ohio, f.o.b.	20.90
Erie, del'd	$20.25 to 21.04
Cleveland, del'd	22.62
Cincinnati, del'd	21.71
St. Paul, f.o.b.	23.50
St. Louis, del'd	21.60
Birmingham, del'd	18.75

FLUORSPAR

Washed gravel fluorspar, f.o.b. cars, Rosiclare, Ill. Base price, per ton net: Effective CaF, content:

70% or more	$37.00
60% or less	34.00

STAINLESS STEELS

Base prices, in cents per pound, f.o.b. producing point

Product	301	302	303	304	316	321	347	410	416	430
Ingots, rerolling	12.75	13.50	15.00	14.50	22.75	18.25	20.00	11.25	13.75	11.50
Slabs, billets, rerolling	17.00	18.25	20.25	19.25	30.25	24.50	26.75	15.00	18.50	15.25
Forg. discs, die blocks, rings	30.50	30.50	33.00	32.00	49.00	38.50	41.00	24.50	25.00	25.00
Billets, forging	24.25	24.25	26.25	25.50	39.00	29.00	32.75	19.50	20.00	20.00
Bars, wire, structurals	28.50	28.50	31.00	30.00	46.00	34.00	38.50	23.00	23.50	23.50
Plates	32.00	32.00	34.00	34.00	50.50	39.50	44.00	26.00	26.50-27.00	26.50
Sheets	37.50	37.50	39.50	39.50	53.00	45.50	50.00	33.00	33.50	35.50
Strip, hot-rolled	24.25	25.75	30.00	27.75	46.00	34.50	38.75	21.25	28.00	21.75
Strip, cold-rolled	30.50	33.00	36.50	35.00	55.00	44.50	48.50	27.00	33.50	27.50

Numbers correspond to producers. See Key on Steel Price Page.

STAINLESS STEEL PRODUCING POINTS—*Sheets:* Midland, Pa., 17; Brackenridge, Pa., 28; Butler, Pa., 7; McKeesport, Pa., 1; Washington, Pa., 38,39; Baltimore, 37; Middletown, Ohio, 7; Massillon, Ohio, 4; Gary, 1; Bridgeville, Pa., 59; New Castle, Ind., 55; Lockport, N. Y., 46.

Strip: Midland, Pa., 17; Cleveland, 2; Carnegie, Pa., 41; McKeesport, Pa., 54; Reading, Pa., 36; Washington, Pa., 38; W. Leechburg, Pa., 28; Bridgeville, Pa., 59; Detroit, 47; Massillon, Canton, Ohio, 4; Middletown, Ohio, 7; Harrison, N. J., 49; Youngstown, 48; Lockport, N. Y., 46; New Britain, Conn., 58; Sharon, 13; Butler, Pa., 7.

Bars: Baltimore, 7; Duquesne, Pa., 1; Munhall, Pa., 1; Reading, Pa., 36; Titusville, Pa., 59; Washington, Pa., 39; McKeesport, Pa., 1, 54; Bridgeville, Pa., 59; Dunkirk, N. Y., 28; Massillon, Ohio, 4; Chicago, 1, 67; Syracuse, N. Y., 17; Watervliet, N. Y., 28; Waukegan, Ill., 2; Lockport, N. Y., 46; Canton, Ohio, 42.

Wire: Waukegan, Ill., 2; Massillon, Ohio, 4; McKeesport, Pa., 54; Bridgeport, Conn., 44; Chicago, 67; Trenton, N. J., 45; Harrison, N. J., 80; Baltimore, 7; Dunkirk, 28.

Structurals: Baltimore, 7; Massillon, Ohio, 4; Chicago, 1, 67; Watervliet, N. Y., 28; Bridgeport, Conn., 44.

Plates: Brackenridge, Pa., 28; Butler, Pa., 7; Chicago, 1; Munhall, Pa., 1; Midland, Pa., 17; New Castle, Ind., 55; Lockport, N. Y., 46; Middletown, 7; Washington, Pa., 39; Cleveland, Massillon, 4.

Forged discs, die blocks, rings: Pittsburgh, 1, 17; Syracuse, 17; Ferndale, Mich., 28.

Forging billets: Midland, Pa., 17; Baltimore, 7; Washington, Pa., 39; McKeesport, 54; Massillon, Canton, Ohio, 4; Watervliet, 28; Pittsburgh, Chicago, 1.

REFRACTORIES (*F.o.b. works*)

Fire Clay Brick *Carloads, Per 1000*

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5) $86.00
No. 1 Ohio 80.00
Sec. quality, Pa., Md., Ky., Mo., Ill. .. 80.00
No. 2 Ohio 72.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50) 14.00

Silica Brick

Mt. Union, Pa., Ensley, Ala. $86.00
Childs, Pa. 90.00
Hays, Pa. 91.00
Chicago District 95.00
Western, Utah and Calif. 101.00
Super Duty, Hays, Pa., Athens, Tex., Chicago 106.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.) 15.00
Silica cement, net ton, bulk, Hays, Pa. 17.00
Silica cement, net ton, bulk, Ensley, Ala. 16.00
Silica cement, net ton, bulk, Chicago District 16.00
Silica cement, net ton, bulk, Utah and Calif. 22.50

Chrome Brick *Per Net Ton*

Standard chemically bonded, balt., Chester $69.00

Magnesite Brick

Standard, Baltimore $91.00
Chemically bonded, Baltimore 80.00

Grain Magnesite *Std. ¾-in. grains*

Domestic, f.o.b. Baltimore, in bulk, fines removed .. $56.00 to $56.50
Domestic, f.o.b. Chewelah, Wash., in bulk with fines ..... 30.50 to 31.00
in sacks with fines ..... 35.00 to 35.50

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk, Midwest, add 10¢; Missouri Valley, add 20¢ ... $12.25

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.l.f. New York, ocean bags ... 7.4¢ to 9.0¢
Domestic sponge iron, 98+% Fe, carload lots ..... 9.0¢ to 15.0¢
Electrolytic iron, annealed, 99.5+% Fe ..... 31.5¢ to 39.5¢
Electrolytic iron unannealed, minus 325 mesh, 99+% Fe ..... 48.5¢
Hydrogen reduced iron, minus 300 mesh, 98+% Fe .. 63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 microns, 98%, 99.8+% Fe 90.0¢ to $1.75
Aluminum ..... 29.00¢
Antimony ..... 42.53¢
Brass, 10 ton lots ..... 23.25¢ to 26.75¢
Copper, electrolytic ..... 28.625¢
Copper, reduced ..... 28.50¢
Cadmium $2.40
Chromium, electrolytic, 99% min. $3.50
Lead ..... 18.50¢
Manganese ..... 55.00¢
Molybdenum, 99% $2.55
Nickel, unannealed ..... 61.00¢
Nickel, spherical, minus 30 mesh, unannealed ..... 68.00¢
Silicon ..... 34.00¢
Solder powder ..... 8.5¢ plus metal cost
Stainless steel, 302 ..... 75.00¢
Tin ..... 86.50¢
Tungsten, 99% $2.90
Zinc, 10 ton lots ..... 15.50¢ to 18.25¢

ELECTRODES

Cents per lb, f.o.b. plant, threaded electrodes with nipples, unboxed

Diam. in in.	Length in in.	Cents Per lb
	GRAPHITE	
17, 18, 20	60, 72	16.00¢
8 to 16	48, 60, 72	16.50¢
7	48, 60	17.75¢
6	48, 60	19.00¢
4, 5	40	19.50¢
3	40	20.50¢
2½	24, 30	21.00¢
2	24, 30	23.00¢
	CARBON	
40	100, 110	7.50¢
35	65, 110	7.50¢
30	65, 84, 110	7.50¢
24	72 to 104	7.50¢
17 to 20	84, 90	7.50¢
14	60, 72	8.00¢
10, 12	60	8.25¢
8	60	8.50¢

PIPE AND TUBING

Base discounts, f.o.b. mills
Base price, about $200.00 per net ton

Standard, T & C

	Black	Galv
Steel, buttweld*		
⅛-in.	40½ to 38½	24 to 22
¼-in.	43½ to 41½	28 to 26
1-in.	46 to 44	31 to 29
1¼-in.	46½ to 44½	31½ to 29½
1½-in.	47 to 45	32 to 30
2-in.	47½ to 45½	32½ to 30½
2½ to 3-in.	48 to 46	33 to 31
Steel, lapweld		
2-in.	37	23½ to 21½
2½ to 3-in.	41 to 40	25½ to 24½
3½ to 6-in.	44 to 40	28½ to 24½
Steel, seamless		
2-in.	36	20½
2½ to 3-in.	39	23½
3½ to 6-in.	41	25½
Wrought Iron, buttweld		
⅛-in.	+26½	+53
¼-in.	+16½	+42
1 & 1¼-in.	+10½	+33
1½-in.	+ 4½	+29½
2-in.	+ 4	+29
Wrought Iron, lapweld		
2-in.	+13½	+37
2½ to 3½-in.	+11	+32½
4-in.	+ 6	+26½
4½ to 8-in.	+ 8	+28
9 to 12-in.	+18	+37½

Extra Strong, Plain Ends

Steel, buttweld		
⅛-in.	39½ to 37½	24½ to 22½
¼-in.	43½ to 41½	28½ to 26½
1-in.	45½ to 43½	31½ to 29½
1¼-in.	46 to 44	32 to 30
1½-in.	46½ to 44½	32½ to 30½
2-in.	47 to 45	33 to 32
2½ to 3-in.	47½ to 45½	33½ to 31½
Steel, lapweld		
2-in.	37 to 36	22½ to 21½
2½ to 3-in.	42 to 40	27½ to 25½
3½ to 6-in.	45½ to 41½	31 to 29
Steel, seamless		
2-in.	35	20½
2½ to 3-in.	39	24½
3½ to 6-in.	42½	28
Wrought Iron, buttweld		
⅛-in.	+22	+47
¼-in.	+15½	+40
1 to 2-in.	+ 5½	+29
Wrought Iron, lapweld		
2-in.	+10½	+33½
2½ to 4-in.	+ 1	+22
4½ to 6-in.	+ 5	+26½
7 & 8-in.	list	+21½
9 to 12-in.	+11½	+29½

For threads only, buttweld, lapweld and seamless pipe, one point higher discount (lower price) applies. For plain ends, buttweld, lapweld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lapweld and seamless 3½-in. and larger four points higher discount (lower price) applies. On buttweld and lapweld steel pipe, jobbers are granted a discount of 5 pct.
*Fontana, Calif., deduct 11 points from figures in left columns.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Prices per 100 ft at mill in carload lots, cut lengths 10 to 24 ft inclusive.

OD in in.	gage BWG	Seamless H.R.	Seamless C.R.	Electric H.R.	Weld C.D.
2	13	$20.61	$24.24	$19.99	$23.51
2½	12	27.71	32.58	26.88	31.60
3	12	30.82	36.27	29.90	35.18
3½	11	38.52	45.38	37.36	43.99
4	10	47.82	56.25	46.39	54.56

CAST IRON WATER PIPE

Per net ton

6 to 20-in., del'd Chicago $95.70
6 to 24-in., del'd N. Y. ..... $92.50 to 97.40
6 to 24-in., Birmingham 82.50
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less 109.30
Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

WAREHOUSE PRICES

Base prices, f.o.b. warehouse, dollars per 100 lb.
(Metropolitan area delivery, add 20c to base price except Birmingham, Cincinnati, Los Angeles, New Orleans and Philadelphia (*), add 15c).

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140-50 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140-50 Ann.
Baltimore	5.05	6.24-6.44[1]	6.46-6.46[2]	5.59-5.59[11]	....	5.20-5.64[11]	5.49	5.49-5.49[11]	6.19	....	10.05	....	....
Birmingham*	5.05[10]	5.80	6.15[7]	5.10[10]	....	5.20	5.65	5.00[10]	6.73	....	....	....	....
Boston	5.73	6.48[20]-6.85	6.79-7.24	5.78	6.90-6.95	5.88	5.55	5.60	6.02-6.58	9.70-9.97	9.90-10.37	11.15	11.45
Buffalo	5.05	5.80	6.80	5.41	7.27	5.45	5.15	5.05	5.65	9.60	9.90	11.05	11.35
Chicago	5.05	5.80	6.70	5.10	5.45-6.16	5.20	5.05	5.00	5.65	9.25	9.55	10.70	11.00
Cincinnati*	5.32-5.97	5.80-6.24	6.29-6.39	5.49	....	5.58-5.74	5.44-5.59	5.39-5.54	6.10-6.25	9.60-9.81	9.90-10.11	11.05-11.26	11.35-11.55
Cleveland	5.05	5.80	6.95	5.24	6.35	5.32	5.17	5.12	5.75	9.36	9.66	10.81	11.11
Detroit	5.33	6.08	7.09	5.49	6.27-6.58	5.59	5.44	5.39	6.03	9.56	9.86	11.01	11.31
Houston	5.75	....	....	6.10	....	6.00	5.95	6.10	7.80	10.35-10.45	10.50-10.60	11.50	11.95-12.10
Indianapolis	....	....	....	....	7.36	....	....	....	....	....	....	....	....
Kansas City	5.65	6.40	7.30	5.70	6.95	5.80	5.65	5.60	6.35	9.85	10.15	11.30	11.60
Los Angeles*	5.80	7.00	7.45[2]	5.85	7.35-7.85[16]	5.80	5.70	5.80	7.55	10.05	10.20	11.70	12.10
Memphis	5.93	6.68	....	5.98	6.80	6.08	5.93	5.68	....	....	....	....	....
Milwaukee	5.19	5.94	6.84	5.24	6.32	5.34	....	5.14	5.89	9.39	9.69	10.84	11.14
New Orleans*	5.50[1]	6.85[1]	....	5.55[1]	6.90[1]	5.65	5.55[1]	5.55[1]	6.75	....	....	....	....
New York	5.55-5.65	6.54-6.64	6.90-7.00	5.84	6.76[5]	5.70	5.45	5.65	6.44	9.60	9.90	11.05	11.35
Norfolk	6.10	7.00	....	6.30	....	6.15	6.20	6.15	7.20	....	....	....	....
Omaha	....	....	....	....	....	....	....	....	....	....	....	....	....
Philadelphia*	5.30	6.20	6.70	5.65	6.29	5.	5.25	5.50	6.31	9.35	9.65	10.80	11.10
Pittsburgh	5.05	5.80	6.70	5.20	6.00	5.	5.05	5.00	5.75	9.25	9.55	10.70	11.00
Portland	6.60-7.10[1]	8.40[2]	8.20[2]	6.85[5]	....	....	6.50	6.45-6.45[5]	8.60[14]	12.00[18]	11.60[19]	....	....
Salt Lake City	5.85	6.70	8.75	7.45	8.75	6.	5.90	7.35[8]	8.75	....	....	....	....
San Francisco	6.25[11]	7.60[2]	7.50[2]	6.75[11]	8.25	6.1[13]	6.00	6.15[11]	7.80	....	....	....	....
Seattle	6.70[4]	8.15[2]	8.20[2]-8.35[2]	7.35[4]	....	6.	6.20[4]-6.25[4]	6.35[4]	8.50[14]	....	10.60[15]-11.60[15]	....	13.60[15]-14.60[15]
St. Louis	5.38	6.13	7.03	5.43	6.68-7.54	5.53	5.38	5.33-5.35	6.08	9.58	9.88	11.03	11.33
St. Paul	5.76	6.51	7.41	5.81	6.16-6.82	5.1	5.76	5.71	6.42	9.95	10.23	11.41	11.71

BASE QUANTITIES: (*Standard unless otherwise keyed on prices*).

Hot-rolled sheets and strip, hot rolled bars and bar shapes, structural shapes, plate, galvanized sheets and cold-rolled sheets: 2000 to 9999 lb. Cold-finished bars: 1000 lb or over. Alloy bars: 1000 to 1999 lb.

All HR products may be combined to determine quantity bracket. All galvanized sheets may be combined to determine quantity bracket. CR sheets may not be combined with each other or with galv. sheets to determine quantity bracket.

Exceptions:
(1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 9999 lb; (5) 2000 to 5999 lb; (6) 1000 lb and over; (7) 500 to 1499 lb; (8) 400 lb and over; (9) 400 to 9999 lb; (10) 500 to 9999 lb; (11) 400 to 3999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 9999 lb; (16) 6000 lb and over; (17) up to 1999 lb; (18) 1000 to 4999 lb; (19) 1500 to 3499 lb; (20) CR sheets may be combined for quantity.

PIG IRON PRICES

Dollars per gross ton. Delivered prices do not include 3 pct tax on freight.

PRODUCING POINT PRICES

Producing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	48.00	48.50	49.00	49.50	.....
Birmingham	38.88-41.88	39.38-42.38	.....	.....	.....
Buffalo	48.00	48.50	47.00	.....	.....
Chicago	46.00	46.50	46.50	47.00	.....
Cleveland	46.00	46.50	46.50	47.00	51.00
Duluth	46.00	46.50	46.50	47.00	.....
Erie	46.00	46.50	46.50	47.00	.....
Everett	.....	50.50	51.00	.....	.....
Granite City	47.90	48.40	48.90	.....	.....
Ironton, Utah	46.00	46.50	.....	.....	.....
Pittsburgh	46.00	48.50	46.50	47.00	.....
Geneva, Utah	46.00	46.50	.....	.....	.....
Sharpsville	46.00	46.50	46.50	47.00	.....
Steelton	48.00	48.50	49.00	49.50	54.00
Struthers, Ohio	46.00	.....	.....	.....	.....
Swedeland	48.00	48.50	49.00	49.50	.....
Toledo	46.00	46.50	46.50	47.00	.....
Troy, N. Y.	48.00	48.50	49.00	.....	54.00
Youngstown	46.00	46.50	46.50	47.00	.....

DELIVERED PRICES (BASE GRADES)

Consuming Point	Producing Point	Rail Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Boston	Everett	$0.50 Arb.	.....	50.50	51.00	.....	.....
Boston	Steelton	6.90	.....	.....	.....	.....	60.90
Brooklyn	Bethlehem	4.29	.....	52.79	53.29	53.79	.....
Cincinnati	Birmingham	6.70	46.58	47.08	.....	.....	.....
Jersey City	Bethlehem	2.63	.....	51.13	51.63	52.13	.....
Los Angeles	Geneva-Ironton	7.70	53.70	54.20	.....	.....	64.33
Mansfield	Cleveland-Toledo	3.33	49.33	49.83	49.83	50.33	.....
Philadelphia	Bethlehem	2.39	50.39	50.89	51.39	51.89	.....
Philadelphia	Swedeland	1.44	49.44	49.94	50.44	50.94	.....
Philadelphia	Steelton	3.09	.....	.....	.....	.....	57.09
Rochester	Buffalo	2.63	48.63	49.13	49.63	.....	.....
San Francisco	Geneva-Ironton	7.70	53.70	54.20	.....	.....	.....
Seattle	Geneva-Ironton	7.70	53.70	54.20	.....	.....	.....
St. Louis	Granite City	0.75 Arb.	48.65	49.15	49.65	.....	.....
Syracuse	Buffalo	3.58	49.58	50.08	50.58	.....	.....

Producing point prices are subject to switching charges; silicon differential (not to exceed 50c per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct for foundry iron); phosphorus differentials, a reduction of 38c per ton for phosphorus content of 0.70 pct and over manganese differentials, a charge not to exceed 50c per ton for each 0.50 pct manganese content in excess of 1.00 pct. $2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and $1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.01 to 6.50 pct. C/L per g.t., f.o.b. Jackson, Ohio—$57.00; f.o.b. Buffalo, $58.25. Add $1.00 per ton for each additional 0.50 pct Si up to 17 pct. Add 50c per ton for each 0.50 pct Mn over 1.00 pct. Add $1.00 per ton for 0.75 pct or more P. Bessemer ferrosilicon prices are $1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorus $60.00 per gross ton, f.o.b. Lyle, Tenn. Delivered Chicago, $68.56. High phosphorus charcoal pig iron is not being produced.

FERROALLOYS

Ferromanganese

78-82% Mn. maximum contact base price, gross ton, lump size.

F.o.b. Birmingham	$174
F.o.b. Niagara Falls, Alloy, W. Va., Welland, Ont.	$172
F.o.b. Johnstown, Pa.	$174
F.o.b. Sheridan, Pa.	$172
F.o.b. Etna, Clairton, Pa.	$175

$2.00 for each 1% above 82% Mn, penalty, $2.15 for each 1% below 78%.

Briquets—Cents per pound of briquet, delivered, 66% contained Mn.

Carload, bulk	10.45
Ton lots	12.05
Less ton lots	12.95

Spiegeleisen

Contract prices gross ton, lump, f.o.b

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Palmerton, Pa.	$64.00	$65.00
Pgh. or Chicago	65.00	66.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.

Carload, packed	35.5
Ton lots	37.0

Electrolysic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	28
Ton lots	30
Less ton lots	32

Low-Carbon Manganese

Contract price, cents per pound Mn contained, lump size, delivered.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	25.25	27.10	28.30
0.10% max. C	24.75	26.60	27.80
0.15% max. C	24.25	26.10	27.30
0.30% max. C	23.75	25.60	26.80
0.50% max. C	23.25	25.10	26.30
0.75% max. C, 7.00% max. Si	20.25	22.10	23.30

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C. For 2% max. C, deduct 0.2¢.

Carload bulk	8.95
Ton lots	10.60
Briquet, contract basis carlots, bulk delivered, per lb of briquet	10.30
Ton lots	11.90
Less ton lots	12.80

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $77.00 gross ton, freight allowed to normal trade area; Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $73.50. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.

96% Si, 2% Fe	20.70
97% Si, 1% Fe	21.10

Silicon Briquets

Contract price, cents per pound of briquet, bulk, delivered, 40% Si, 1 lb Si briquets.

Carload, bulk	6.30
Ton lots	7.90
Less ton lots	8.80

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size, bulk, in carloads, delivered.

25% Si	17.00
50% Si	11.30
75% Si	13.50
85% Si	14.65
90-95% Si	16.50

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk, in carloads, delivered. (65-72% Cr, 2% max. Si)

0.06% C	28.75
0.10% C	28.25
0.15% C	28.00
0.20% C	27.75
0.50% C	27.50
1.00% C	27.25
2.00% C	27.00
65-69% Cr, 4-9% C	20.50
62-66% Cr, 4-6% C, 6-9% Si	21.35

Briquets — Contract price, cents per pound of briquet, delivered ,60% chromium.

Carload bulk	13.75
Ton lots	15.25
Less ton lots	16.15

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.

S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, delivered.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads	21.60
Ton lots	23.75
Less ton lots	25.25

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.

Carloads	27.75
Ton lots	30.05
Less ton lots	31.85

Chromium Metal

Contract prices, per lb chromium contained packed, delivered, ton lots. 97% min. Cr, 1% max. Fe.

0.20% max. C	$1.09
0.50% max. C	1.05
9.00 min. C	1.04

Calcium-Silicon

Contract price per lb of alloy, lump, delivered.

30-33% Ca, 60-65% Si, 3.00% max. Fe.

Carloads	17.90
Ton lots	21.00
Less ton lots	22.50

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	19.25
Ton lots	21.55
Less ton lots	22.55

CMSZ

Contract price, cents per pound of alloy, delivered.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

Ton lots	19.75
Less ton lots	21.00

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.

Ton lots	15.75¢
Less ton lots	17.00¢

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	17.00¢
Ton lots to carload packed	18.00¢
Less ton lots	19.50¢

SMZ

Contract price, cents per pound of alloy, delivered. 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

Ton lots	17.25
Less ton lots	18.50

Other Ferroalloys

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.	
Carload	7.65¢
Ton lots	9.05¢
Calcium molybdate, 45-40%, f.o.b. Langeloth, Pa., per pound contained Mo.	96¢
Ferrocolumbium, 50-60% contract basis, delivered, per pound contained Cb.	
Ton lots	$2.90
Less ton lots	2.95
Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo.	$1.13
Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. Siglo, Mt. Pleasant, Tenn., $3 unitage, per gross ton	$65.00
10 tons to less carload	75.00
Ferrotitanium, 40%, regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed east of Mississippi and north of Baltimore, ton lots, per lb contained Ti	$1.28
Ferrotitanium, 25%, low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed east of Mississippi and north of Baltimore, ton lots, per lb contained Ti	$1.40
Less ton lots	1.45
Ferrotitanium, 15 to 19%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed east of Mississippi and north of Baltimore, carloads per net ton	$160.00
Ferrotungsten, standard, lump or ¼ x down, packed, per pound contained W, 5 ton lots, delivered	$2.25
Ferrocanadium, 35-55%, contract basis, delivered, per pound, contained V.	
Openhearth	$2.90
Crucible	3.00
High speed steel (Primos)	3.10
Molybdic oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa.	95¢
bags, f.o.b. Washington, Pa., Langeloth, Pa.	94¢
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Carload, bulk, lump	11.00¢
Ton lots, bulk, lump	11.50¢
Ton lots, packed, lump	11.75¢
Less ton lots, lump	12.25¢
Vanadium pentoxide, 88-92% V_2O_5 contract basis, per pound contained V_2O_5	$1.20
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Ton lots	21.00¢
Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.	
Carload, bulk	6.60¢

Boron Agents

Contract prices, per lb of alloy, del.

Borosil, f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B	$4.25
Bortam, f.ob. Niagara Falls	
Ton lots, per pound	45¢
Less ton lots, per pound	50¢
Carbortam, f.o.b. Suspension Bridge, N. Y.: freight allowed. Ti 15-18%, B 1.00-1.50%, Si 2.5-3.0%, Al 1.0-2.0%.	
Ton lots, per pound	3.625¢
Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots	$1.20
F.o.b. Wash., Pa.: 100 lb and over	
10 to 14% B.	.75
14 to 19% B.	1.20
19% min. B.	1.50
Grainal, f.o.b. Bridgeville, Pa. freight allowed, 100 lb and over.	
No. 1	93¢
No. 6	63¢
No. 79	45¢
Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, delivered.	
Ton lots	$1.67
Less ton lots	1.79
Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.	
Less ton lots	$1.80
Silcaz, contract basis, delivered	
Ton lots	45.00¢

New
UNIT 1520
Self-Propelled
RUBBER-TIRED
CRANE

15
TON
CAPACITY

COMPLETELY CONVERTIBLE

TO ALL ATTACHMENTS

This 50,000 pound Mobile Crane is a completely new member of the UNIT Crane and Shovel line. Designed for both "on and off" highway operation. So compact, it works efficiently even in small, cramped quarters, "in or out" of the yard.

- Rugged Construction
- Perfectly Balanced
- Hook Roller Construction
- Operated by ONE Man
- Powered by ONE Engine
- Hydraulic Steering
- Air Brakes and 4 Speed Air-Actuated Transmission
- Heavy Duty, yet operated with remarkable SPEED . . . SAFETY . . . ECONOMY!

UNIT 1520 can be equipped with retractable high A-Frame to permit capacity loads on extended boom at long radius.

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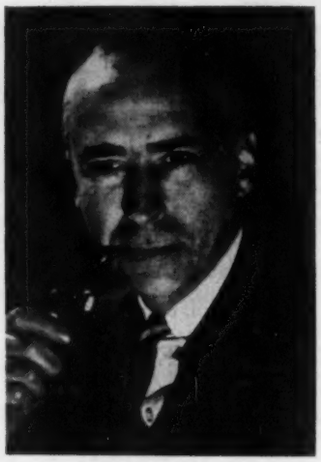
SHOVELS • DRAGLINES • CLAMSHELLS
CRANES • TRENCHOES • MAGNETS

A 5413-2/3CA

Iron Age Introduces

Continued from Page 23

William E. Pfleger and **Thomas Tannert** were recent additions to the sales staff of the WROUGHT WASHER MFG. CO., Milwaukee. Mr. Pfleger will cover Wisconsin, Iowa and Minnesota, while Mr. Tannert will head the company's new Chicago office.



GEORGE PETERSON, JR., manager of special products division, Riverside Metal Co.

George Peterson, Jr., has become manager of the new special products division of the RIVERSIDE METAL CO., Riverside, N. J. This new unit of the company's Keystone watch case division has been established to seek out special products. Mr. Peterson has been for the past year a consulting engineer on aircraft jet engines and electronics equipment in Philadelphia.

A. C. Thompson, formerly works manager of the Bartlett Hayward plant of KOPPERS CO., INC., Pittsburgh, has been promoted to the position of production manager of the company's metal products division. Mr. Thompson will be responsible for production, methods, incentives and service at both Bartlett Hayward and the American Hammered Piston Ring plants of the division. Both plants are located in Baltimore.

Walter A. Bayer and **William F. Clemons** have both been appointed to the Detroit district sales staff of the UDYLITE CORP. Both men were employed by Udylite in other capacities prior to their sales appointments.

ON LINE NEWS

REG. U. S. PAT. OFF.

VOL. 17, NO. 7 FEBRUARY, 1950

...the "near editor's" viewpoint...

The reason why some of us worry so much about the future is probably because we have to spend the rest of our lives in it.

As years pile up, we don't try to drive as fast as in our youth. Maybe we get wiser as we grow older. If not, we probably wouldn't live that long.

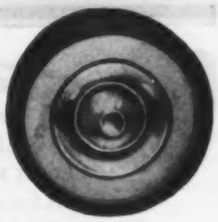
As an ex-tuna fishing fan, I now admit that catching bluefish is far more interesting than *not* catching tuna.

One of the few differences between poker and politics is that in poker a misdeal results in a "new deal."

Aaron E. Carpenter

PRESIDENT.

Well Rounded Service



Faster drawing, with no after-cleaning required, is the experience of a Detroit manufacturer of wheel covers, using *Houghto-Draw* mixed 1 to 3 with water. The compound is easily removed in hot water. Decorative wheel rings which fit the rims are likewise formed from stainless steel strip through rolls on which *Hocut* (water-soluble oil) is pumped over the rolls. Oven drying does not discolor the rings prior to welding.

The same manufacturer, may we add, depends on Houghton lubricants for gears, ovens, grease cups and general oiling. For further details on drawing lubricants, check "C" at the right.

A Cleaner Story

For cleaning small parts after heat treatment some customers have found it easy to wash the work in a very dilute solution of *Cerfak Liquid,* one of Houghton's synthetic detergents. Five ounces in a power washer holding 4 gallons of water was found to be enough to clean business machine parts, in one instance. A drum of Cerfak Liquid outlasted 4000 pounds of the alkaline cleaner formerly used. (Check "D" on coupon for Data Sheet.)

Discovered: New World In Machining

People laughed at Columbus when he said he'd find a new world — but he did! In every phase of industrial processing there are pioneers who find new ways of doing things — short cuts and economies that mean lower costs.

We at Houghton have been pioneers in cutting fluids. We've made many varieties over the past forty years, but never has there been so much interest as we've recently seen in *Antisep All-Purpose Base,* the development that has established a new concept in cutting oils.

This product can be mixed with water up to 30 to 1 and used for 90% of all machining operations. It has anti-weld characteristics; it cools better, so parts can be handled by operators as they come off the machine; it's antiseptically treated.

And here's where the "Columbus" part comes in: Antisep solutions are being used by a number of firms today as a *lubricant* in automatics as well as a coolant. Yes, a water dilution, yet no harm to bearings!

Just room here for one example: SAE 1045 steel on an automatic was formerly machined with high speed tools, using a straight cutting oil at 49 cents per gallon; now the customer uses a 1-25 dilution of Antisep A. P. Base in both the coolant sump and lubrication reservoir. The saving: $341.60 in 40 working days, on one machine alone.

Ask us to show how your company can make such savings. Check "A" on coupon.

Treating Dies in Salt

Heat treating thin-sectioned dies used for cutting shoe leather, cardboard or plastic has been a problem — until the die makers turned to martempering to avoid distortion.

They used Houghton salts—Liquid Heat 168 at 1525° F., then a quench in Mar-Temp Salt at 510-550° F., followed by a wash in a 1 to 60 water solution of Cerfak Liquid. Pieces come out clean, with the desired hardness. Distortion or breaking have been eliminated by this modern method of heat treatment.

High Speed Chasers

We mean tools, not wolves. They're treated right (the tools) in Houghton salts: a preheat in Liquid Heat 1145, high heat in L. H. 1550, quench and draw in L. H. 800. Rectification is made easy. If you have a high speed steel problem, we'd like to hear about it. Study of our salt bath catalog ("B") will show how you can "Do it Better with Salt."

[illegible] Data — Yours FREE

1. **HYDRAULIC OIL HANDBOOK**—54 pages, listing essentials for a good hydraulic oil; how to clean out systems; hydraulic troubles and remedies.
2. **PERLITON "W"**—water-soluble carburizing salt Data Sheet.
3. **HOUGHTO-CLEAN**—series of metal cleaners, alkaline, emulsion and solvent types, 4-p. folder.
4. **RUST REMOVERS**—folder describing series of chemical products to remove rust from ferrous metals.
5. **ACITROL PICKLING INHIBITORS**—leaflet describing advantages and types.

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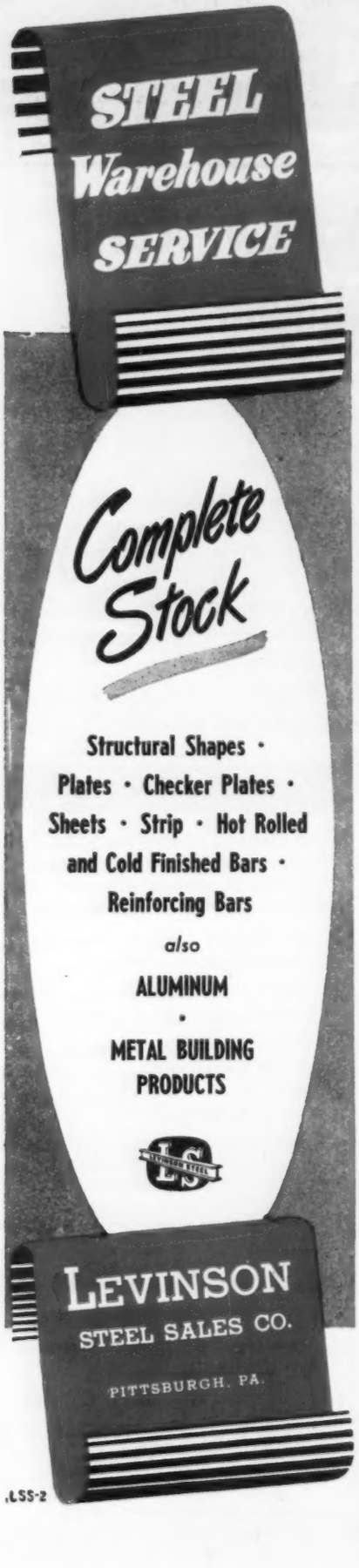


IRON AGE INTRODUCES

Continued

Charles J. Sauter has taken over as sales engineering representative for aluminum bronze and silicon bronze vacuum die castings for the AURORA METAL CO., Aurora, Ill., covering Metropolitan New York and northern New Jersey. **I. R. Jones** becomes sales engineering representative for aluminum bronze and silicon bronze vacuum die castings in the following territory: southern New Jersey, southeastern Pennsylvania, Delaware and Maryland.

CHARLES G. BARNARD, comptroller, Balboa Pacific Corp.

Charles G. Barnard was appointed comptroller of BALBOA PACIFIC CORP., tubular steel furniture manufacturer, at Fullerton, Calif. Mr. Barnard for more than two years has been chief accountant of the Daystrom Corp., Olean, N. Y. Both the Balboa and Daystrom companies are affiliates of ATF INC., which has headquarters at Elizabeth, N. J.

Donald D. Stone, veteran automotive engineer, has been named automotive power plant engineer at WILLYS-OVERLAND MOTORS, Toledo. Mr. Stone joined Willys-Overland in 1939 as research engineer. Later, he was appointed director of research, a post he held until 1947 when he was assigned the duties of equipment engineer.

Milton F. Beecher was elected vice president in charge of research and development by the NORTON COMPANY of Worcester, Mass. Directors of the company re-elected **George N. Jeppson** as board chairman and **Milton P. Higgins** as company president. **Ralph F. Gow**, executive vice presi-

Here's Why

Crane Users

Save Money With

RUD-O-MATIC

TAGLINE CONTROL

1. ON MAGNET PICK-UP JOBS—steel tagline cable takes the load while protective slack is maintained in costly electric cable.

2. ON CLAM SHELL BUCKET JOBS—no swing, no sway. Saves time and improves efficiency.

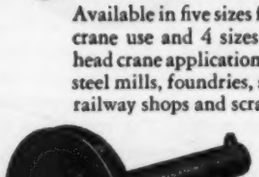
3. ON ALL APPLICATIONS—boom and overhead cranes. A heavy duty coil spring assures constant tension without service problems.

Large bearing and fewer sheaves reduce friction and wear.

Easy installation and easy switch to equipment of similar size.

RUD-O-MATIC
COMBINATION
MAGNET REEL-TAGLINE

Available in five sizes for boom crane use and 4 sizes for overhead crane application. Used by steel mills, foundries, shipyards, railway shops and scrap dealers.



RUD-O-MATIC
TAGLINE

Available in 8 models to provide proper tension and sufficient cable pull out for various size buckets. Used as standard equipment by all leading crane manufacturers.

McCAFFREY-RUDDOCK
Tagline CORPORATION
2131 East 25th St., Los Angeles 11, Calif.

dent, Norton Company, was elected vice president of Norton Pike Company, and **Ralph M. Johnson**, vice president in charge of sales, Norton Company, was named to the Norton Pike Company board.

JAMES L. HYLAND, chairman of the open hearth committee, Republic Steel Corp.

James L. Hyland, who has been in charge of the Cleveland district of REPUBLIC STEEL CORP. since 1939, was named chairman of the open hearth committee which coordinates open hearth steelmaking operations at all of Republic's plants. **Elmer A. Schwartz** succeeds Mr. Hyland as Cleveland district manager.

J. P. Barbour was appointed manager of the aircraft department of the small motor division of WESTINGHOUSE ELECTRIC CORP., Lima, Ohio. The new department will coordinate all aircraft activities in Lima. The aircraft apparatus built at the Lima plant includes alternating current and direct current generating systems, motors, actuators and dynamotors for military and commercial aircraft.

Harold W. Schaefer received the appointment as a special assistant in the research and engineering department of PHILCO CORP., Philadelphia. Mr. Schaefer has been active as a radio, electronics and television engineer for the past 24 years and has served as assistant manager of the Westinghouse home radio division since 1944.

Harold R. Bennett was made manager of industrial sales for THRESHER PAINT & VARNISH CO., in Pittsburgh. Associated with the industrial finish industry for more than 25 years, Mr. Bennett has been with Thresher since 1930.

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STRENGTH, WEIGHT DUCTILITY, MACHINABILITY, WELDABILITY, I.D. and O.D.

Can be Bent,

FLANGED, EXPANDED, TAPERED, DEPRESS BEADED, EXPAND BEADED, ROLLED, EXTERNAL UPSET, INTERNAL UPSET, SPUN CLOSED, FORGED, BEVEL FLANGED, FLATTENED, SWAGED, FLUTED.

Consult us for engineering and technical help in the selection of tubing best suited to your needs.

Design simplification, fabricability, uniformity, ductility, ease of assembly and installation are just a few of the words we use to describe the many advantages of using MICHIGAN TUBING. Whether you manufacture automobile parts, power shovels, toys or typewriters, MICHIGAN TUBING can give you a better product at lower cost.

A Quality Product,

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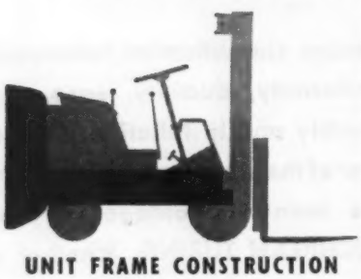
Rugged and Ready

—for the toughest mass handling jobs!



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—another Towmotor efficiency feature

For counter-balancing the load, Towmotor puts as much weight as possible in the frame itself—where it adds strength and stability for maximum, trouble-free service.

See the New Towmotor Movie, "The One Man Gang," right in your office.

Towmotor's exclusive one-piece, all-steel frame construction provides an unusually sturdy unit—***extra*** rigid for rugged service, ***extra*** easy to inspect and maintain. That's why Towmotors ***stay*** on the job dependably . . . even in 24-hour daily service. Compare Towmotor with any other fork lift truck and you will see why Towmotor's rugged features make every **M**ass **H**andling job easier, faster, safer. 10 models plus standard and specially designed accessories handle loads from 1,500 to 15,000 lbs.—a Towmotor for ***every*** job. Write for a copy of "Handling Materials Illustrated." Towmotor Corporation, Division 15, 1226 E. 152nd St., Cleveland 10, Ohio. Representatives in all Principal Cities in U. S. and Canada.

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THE ONE-MAN-GANG®

FORK LIFT TRUCKS and TRACTORS

RECEIVING • PROCESSING • STORAGE • DISTRIBUTION

IRON AGE INTRODUCES

Continued

P. J. SLAVISH, manager of Pittsburgh office, Baldwin Locomotive Works.

P. J. Slavish has become the new manager of the Pittsburgh office of the BALDWIN LOCOMOTIVE WORKS. Mr. Slavish has been with headquarters sales of Standard Steel Works Division of the company.

E. K. Walsh has been named manager of sales for the Atlantic division of the AMERICAN CAN CO., succeeding **T. E. Alwyn** who recently became company-wide general manager of sales. Mr. Walsh had been serving as assistant manager of sales for the division, a post which has been given to **B. R. Wood**, formerly a sales division manager. At the same time the company announced in Chicago the appointment of **D. B. Craver** as assistant manager of sales for the Central division. He also had been a sales division manager. All three men have been with the can-making organization for more than 20 years.

K. A. D. Naoroji, president of TATA INC. since 1945, has returned to India where, as a director of Tata Industries, he will be located in New Delhi. Mr. Naoroji came to the United States originally in 1943, on loan from Tata, as director of supplies of the India supply mission in Washington, D. C.

P. H. McManus has been appointed general sales manager of TEMPLETON, KENLY & CO., Chicago manufacturers of Simplex Jacks. Mr. McManus, a veteran of 31 years' service with the organization, has been active as salesman, district sales manager and assistant general sales manager.

I. T. Kahn was recently elected chairman of the board of CONSOLIDATED IRON-STEEL MFG. CO. of Cleveland. He previously held the position of president. Others winning new posts in the organization included: **Kennedy Davidson**, president and treasurer; **R. A. Godfrey**, executive vice president and secretary; **J. F. Maine**, vice president; **Joseph Hanks, Jr.**, vice president; **L. S. Cawrse**, vice president; **R. J. Foster**, assistant secretary and assistant treasurer; **A. Philip**, assistant treasurer and **J. Kuten**, comptroller.

CLARENCE H. ENDRESS, chief engineer, Willard Storage Battery Co.

Clarence H. Endress was appointed chief engineer of WILLARD STORAGE BATTERY CO., Cleveland. Mr. Endress joined the Willard organization in 1920 as a laboratory assistant. He also served as process engineer and as head of the production and experimental laboratories and as electrical engineer in charge of the battery and electrical laboratories and branch plant process specifications.

Paul Blum, formerly manager of the chemical department of ALAN D. OPPENHEIMER INC., has established his own industrial chemicals and by-products organization, PAUL BLUM CO., at 315 Larkin St. Buffalo.

Charles F. Cooper was made assistant sales manager of the central district of KAISER STEEL CORP. The district covers northern California, southern Oregon, Idaho, Utah, Montana and Nevada. Mr. Cooper joined the organization in 1942.

Frederic Leake, Jr., has been appointed assistant manager of the Evans Lead Division of NATIONAL LEAD CO. Mr. Leake joined the company in 1940 and in 1948 was appointed sales manager of Evans Lead.

One of four Holcroft rotary furnaces, used for carbo-nitriding, clean hardening and deep case carburizing. Includes quench and wash. Gas generator is built into furnace housing. Continuous automatic and batch-type operation are provided.

Typical parts after heat treating in Holcroft rotary furnace.

NEW *Holcroft* ROTARY FURNACE WITH BUILT-IN GAS GENERATOR

Offers Many Practical Advantages...

★ **HIGH PRODUCTION FLEXIBILITY**—Used for carbo-nitriding, clean hardening and deep case carburizing to 1700° F. Ideal for use where volume of work does not warrant a pusher- or conveyor-type furnace. Can be operated as an automatic continuous furnace, or as a batch-type unit with push-button control. Takes small and medium-size work in racks or bulk-loaded in trays. Loading area is 18 sq. ft.; maximum load, 1800 lbs.

★ **BUILT-IN GAS GENERATOR**—New Holcroft gas generator (patent applied for) is enclosed in furnace chamber, giving worth-while savings in cost and floor space. Supplies all diluent gas needed; requires no heat from furnace. Gas produced is unusually low in hydrogen (approximately 20%).

★ **GIVES UNIFORM CASE—MINIMUM WARPAGE**—Positive directed circulation of atmosphere gas by fan, plus 360° indexing of rotary hearth, assures uniform case even with bulk loading. Warpage is negligible, and stock comes out clean.

This new furnace is typical of the continuous developments which have maintained Holcroft leadership in furnace engineering for more than 30 years. This progressive leadership, implemented by *complete metallurgical and engineering service*, is your assurance of better work at lower cost in heat treat processing of every kind. We invite your inquiries.

SINCE 1916 *Holcroft* AND COMPANY

BUILT BY HOLCROFT & COMPANY DETROIT-MICH.

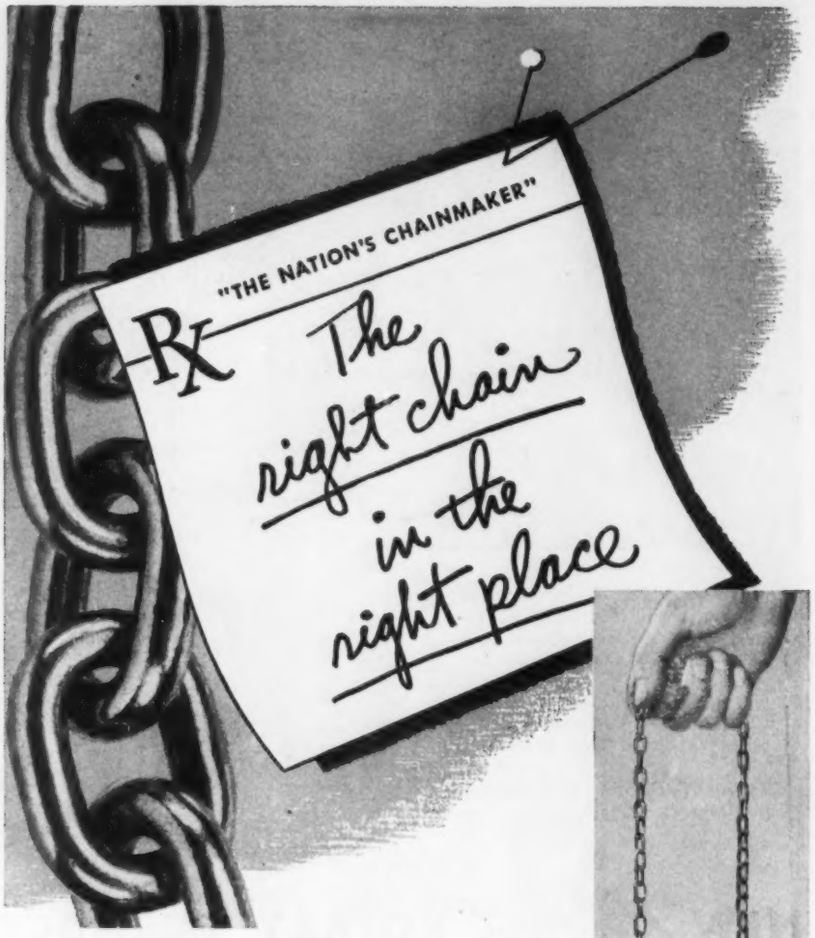
PRODUCTION HEAT TREAT FURNACES FOR EVERY PURPOSE

6545 EPWORTH BLVD. DETROIT 10, MICHIGAN

CHICAGO 3
C. H. MARTIN, A. A. ENGELHARDT
1017 PEOPLES GAS BLDG.

CANADA
WALKER METAL PRODUCTS, LTD.
WALKERVILLE, ONTARIO

HOUSTON 1
R. E. McARDLE
5724 NAVIGATION BLVD.



Here at York, we do not think of chain-making as merely a matter of producing tonnage. To offer a line of products as complete as the AMERICAN CHAIN line requires an intimate knowledge of chain design, the best use of alloys, proper heat-treating, galvanizing—plus the necessary machinery and equipment to take full advantage of that knowledge.

AMERICAN makes chain in sizes from that of a ship's anchor chain to that of a fish stringer. But size is only part of the story. A wide selection of patterns, material analyses and finishes—as well as a complete range of fittings and attachments—makes AMERICAN truly the

"COMPLETE CHAIN LINE"

York, Pa., Chicago, Denver, Detroit, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Bridgeport, Conn.

AMERICAN CHAIN

ACCO

AMERICAN CHAIN DIVISION
AMERICAN CHAIN & CABLE

TRADE MARK

In Business for Your Safety

IRON AGE INTRODUCES

Continued

H. G. Culbertson, formerly manager of the eastern geographic division of the B. F. GOODRICH CO. retired recently after 29 years of service for the company; his duties have been taken over by **H. M. Rockwell,** in addition to his previous responsibilities. Three new district field managers were appointed: **Fred J. Sell,** St. Louis; **Robert M. Frasher,** Memphis and **L. V. Patton,** Denver, a newly created territory. **E. H. Mueller,** who had been district field manager in Atlanta, has been transferred to Washington, D. C., in a similar post and is succeeded by **R. W. Cotterman,** who had been district field manager in Washington.

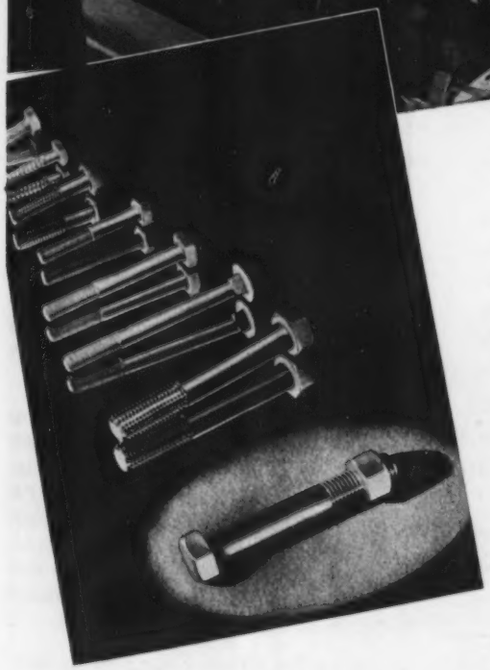
ROBERT F. FETTIG, district manager of Detroit and Michigan sales areas, Elastic Stop Nut Corp. of America.

Robert F. Fettig is the new district manager of the Detroit and Michigan sales areas for the ELASTIC STOP NUT CORP. OF AMERICA, Union, N. J. Before coming to the company, Mr. Fettig was district manager for the McKay Co. of Pittsburgh, and prior to that was with the Detroit diesel division of General Motors, in charge of industrial sales for the central region.

Roy B. Johns has been elected a vice president of FREEPORT SULPHUR CO., New York. Mr. Johns, a native Texan, joined the Freeport organization in 1915 and has been assistant vice president and sales manager since 1930.

Arnold L. Horelick was appointed engineering manager and **John J. Zinsky** chief mechanical engineer for the PENNSYLVANIA TRANSFORMER CO. in Pittsburgh.

"All Our Plants Use *Udylite* Equipment"



Products of Russell, Burdsall & Ward Bolt & Nut Co. cadmium-plated by Udylite Barrel equipment at their Port Chester, N. Y., plant. This firm also has plants in Pennsylvania, Illinois and California, all using Udylite equipment.

Says Russell, Burdsall & Ward Bolt & Nut Co.

"It Gives Our Products Greater Customer Acceptance!"

EVERY DAY alert manufacturers like Russell, Burdsall & Ward Bolt & Nut Co. are turning to Udylite plating equipment for fine finishes and dependable operation.

They've found both Udylite automatic and barrel equipment give their products better, more uniform metal finishes at lower cost.

Udylite automatic equipment reduces direct labor costs, holds maintenance to a minimum and requires less floor space per unit.

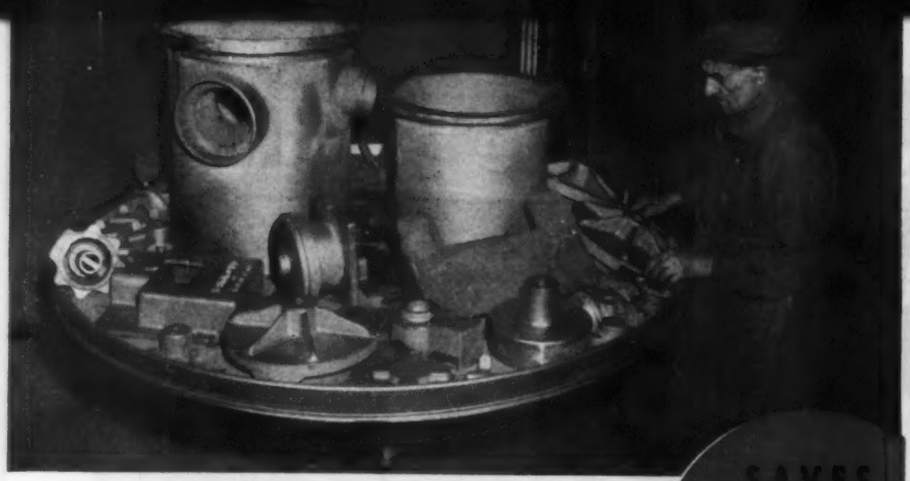
Udylite barrel equipment for cyanide and acid baths, is noted for rugged construction and low-cost operation.

Add up these advantages and you'll see why Udylite plating equipment is your best investment.

In addition, Udylite offers *complete* plating service—before and after installation. If you are planning a new installation or if you face a plating problem with your present equipment—it will pay you well to call in your Udylite Technical Man. He'll be glad to help you at any time—without any obligation. Call him today or write to us direct.

PIONEER OF A BETTER WAY IN PLATING

THE *Udylite* CORPORATION
DETROIT 11, MICHIGAN



wheelabrator®
airless blast cleaning

SAVES $5,440 YEARLY

COST COMPARISON CHART		
	FORMER METHOD	WHEELABRATOR METHOD
MACHINE	3 tumbling mills	66" Wheelabrator Swing Table
PRODUCTION	2 tons per day	4 tons per day
LABOR	2 men — 12 man hours per day	2 men — 6 man hours per day
CLEANING COST	Per ton — $8.095	Per ton — $2.655

SAVINGS per ton $5.44 per day $21.76 per year $5,440.00

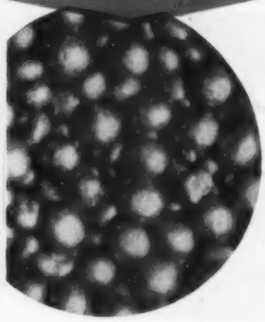
Elkhart Iron Works cuts cost 60%

The Elkhart Iron Works of Elkhart, Indiana, with a production of only four tons daily, has a wide variety of castings to clean because of the many building specialties they produce. Their previous cleaning method was unsatisfactory because of high breakage, and the relatively high cost and poor quality of cleaning.

The 66" Wheelabrator Swing Table eliminated costly breakage, cut cleaning costs 66%, did a thorough job of cleaning, and produced the high quality finish desired.

There is no sounder investment than a Wheelabrator because it customarily pays for itself out of savings within 6 to 18 months. *Why not find out more today?*

TRU-STEEL ***shot cost less to use***



Accurate records were kept by a soil pipe foundry comparing TRU-STEEL and chilled iron shot over a period of 104.5 wheel hours. Only 3.349 lbs. of TRU-STEEL shot was needed to do the same work as 19.27 lbs. of Chilled Iron. Result: a saving of $80.64 or 65%.*

***Name on request*

American
WHEELABRATOR & EQUIPMENT CORP.
510 S. Byrkit St., Mishawaka 3, Ind.

WORLD'S LARGEST BUILDERS OF AIRLESS BLAST EQUIPMENT

IRON AGE INTRODUCES

Continued

JAMES F. McCARTNEY, general sales manager, Duff-Norton Mfg. Co.

James F. McCartney has been made general sales manager of the DUFF-NORTON MFG CO. in Pittsburgh, in charge of all industrial, mining and railroad sales.

Dennis A. Riordan was elected treasurer of the HOOKER ELECTROCHEMICAL CO., Niagara Falls, N. Y., succeeding **John F. Bartlett** who retired as treasurer and assistant secretary on December 1 of last year.

Dr. Franklin T. Peters has been assigned to the newly formed development department of GLYCO PRODUCTS CO. of Brooklyn. He has been with the company in the sales department, since 1947 following ten years with the E. I. duPont de Nemours & Co. in research positions.

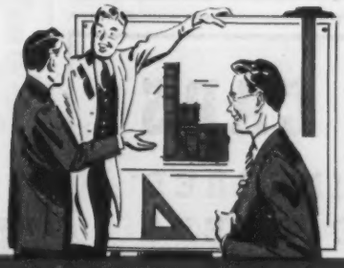
Elwood Broadwater has resigned as news editor of radio station WCMW in Canton, Ohio, to become director of public relations for the SALEM ENGINEERING CO. of Salem, Ohio. Mr. Broadwater recently accompanied Salem Engineering's president Sam Keener, on a four-and-a-half month business flight around the world.

John P. Critchlow has been appointed chief fuels and lubricants engineer, rolling mill section, industrial products engineering, GULF OIL CORP., Pittsburgh. Prior to joining Gulf he had been associated with the Mesta Machine Co., Pittsburgh, as rolling mill design engineer.

Edward Manhard was elected chairman of the board of directors and **Charles R. Roberts** president of the ROCK ISLAND BRIDGE & IRON WORKS, INC., Rock Island, Illinois.

Turn to Page 176

Designed for



Continuous Operation

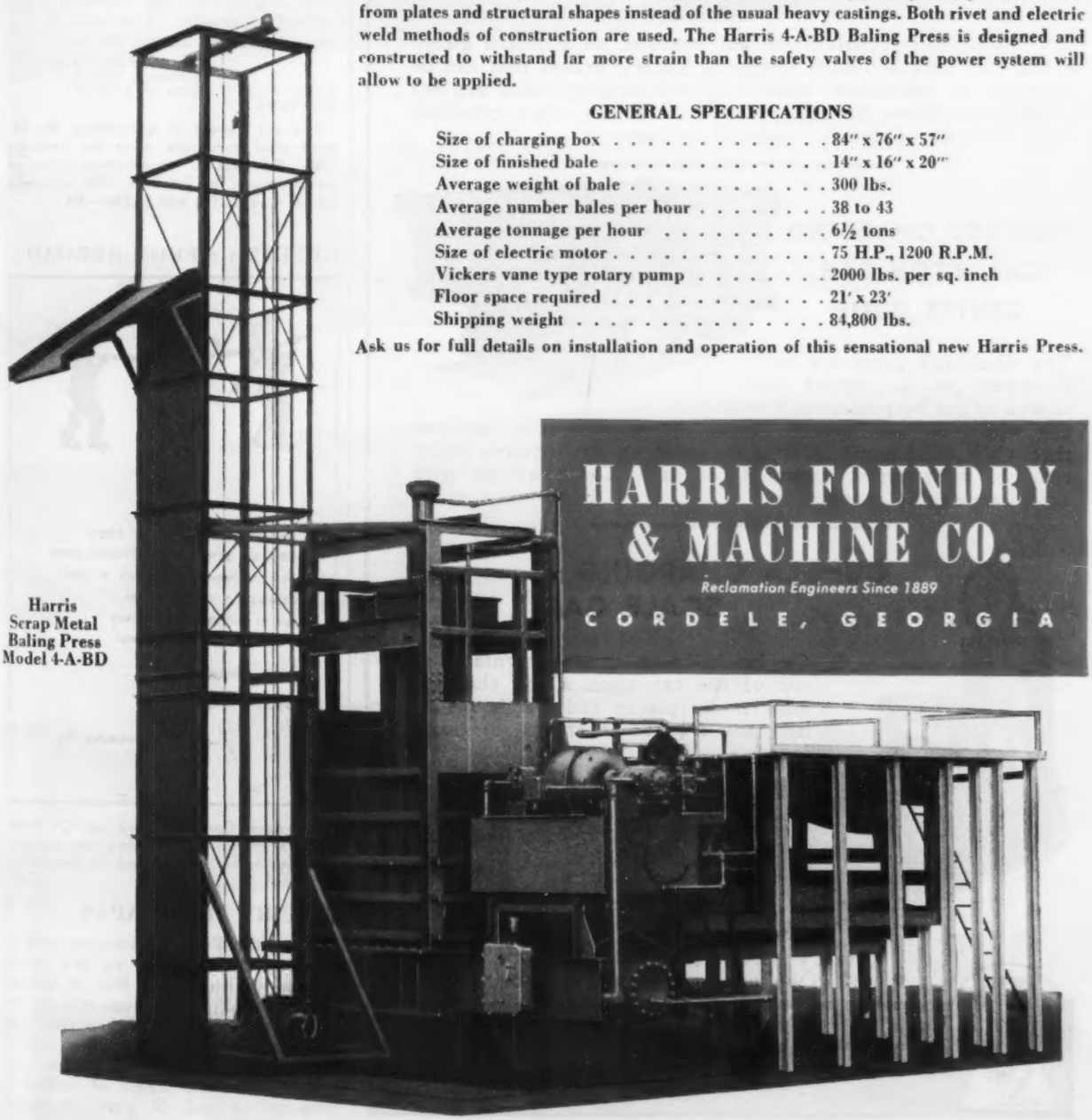
THE NEW HARRIS PRESS

BOTTOM DROP-OUT FOR BALES SPEEDS PRODUCTION—This revolutionary design is a great time saver and profit maker. While the compression chamber is baling, the charging chamber is receiving a new load. No bale is too large to come out of the new, speedy, bottom drop-out. This new Harris Press is of exceptionally sturdy construction from plates and structural shapes instead of the usual heavy castings. Both rivet and electric weld methods of construction are used. The Harris 4-A-BD Baling Press is designed and constructed to withstand far more strain than the safety valves of the power system will allow to be applied.

GENERAL SPECIFICATIONS

Size of charging box	84" x 76" x 57"
Size of finished bale	14" x 16" x 20"
Average weight of bale	300 lbs.
Average number bales per hour	38 to 43
Average tonnage per hour	6½ tons
Size of electric motor	75 H.P., 1200 R.P.M.
Vickers vane type rotary pump	2000 lbs. per sq. inch
Floor space required	21' x 23'
Shipping weight	84,800 lbs.

Ask us for full details on installation and operation of this sensational new Harris Press.



Harris
Scrap Metal
Baling Press
Model 4-A-BD

HARRIS FOUNDRY & MACHINE CO.

Reclamation Engineers Since 1889

CORDELE, GEORGIA

ATLAS

INTRA PLANT CARS

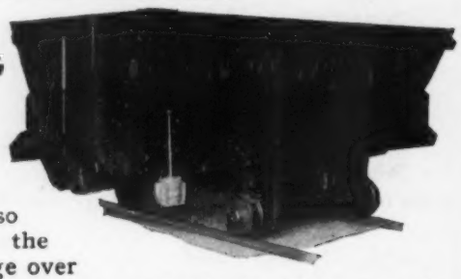
DESIGNED AND ENGINEERED FOR YOUR SPECIFIC NEEDS

STORAGE BATTERY FLAT CAR

60-TON CAPACITY

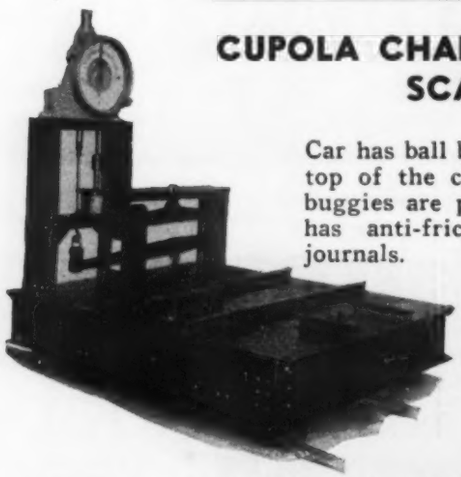
This self-propelled flat car operates on standard gauge track. Car provided with hydraulic electric brakes that can be operated by handwheel when long overhanging loads are encountered. These battery propelled cars are often provided with charging equipment mounted on car.

FURNACE CHARGING CAR, 8-TON CAP. CENTER DUMP



The discharge gates are so arranged as to spread the charge to the best advantage over the width of the furnace. Gates are hydraulically operated through a hand pump. Car is mounted on anti-friction roller bearings with spring mounted journals. Car provided with automatic engine couplers.

CUPOLA CHARGING SCALE CAR



Car has ball bearing steel turntable on top of the car upon which charging buggies are placed and weighed. Car has anti-friction bearings at main journals.

Send for illustrated booklet on all types of intra-plant cars.

ATLAS ENGINEERING SERVICE IS ALWAYS AT YOUR SERVICE

THE ATLAS CAR & MFG. CO.

ENGINEERS MANUFACTURERS

Dear Editor

STEEL COMPOSITE

I note in the January 5 issue, p. 157, in your Finished Steel Composite Price, that you show a price decrease in February, 1948. This does not square at all with your issues of February and March, 1948. In fact, the data presented there suggests that the February price should actually have been larger than the January price instead of smaller. I wonder if you could check this matter for me.

OTIS BRUBAKER
Director, Research Dept.
United Steel Workers of America
Pittsburgh

You are correct in questioning the finished steel composite price for February 1948. This was a typographical error of transposition. The February 1948 composite should read 3.215¢ not 3.125¢.—Ed.

GREETINGS FROM ABROAD

Warmest regards to all my friends
Here and abroad in the Christmas sense.
May the Heaven be gracious to them
Especially to all Foundrymen.
And to everybody, everywhere
I wish a happy and peaceful

NEW YEAR

Aachen 1949/50

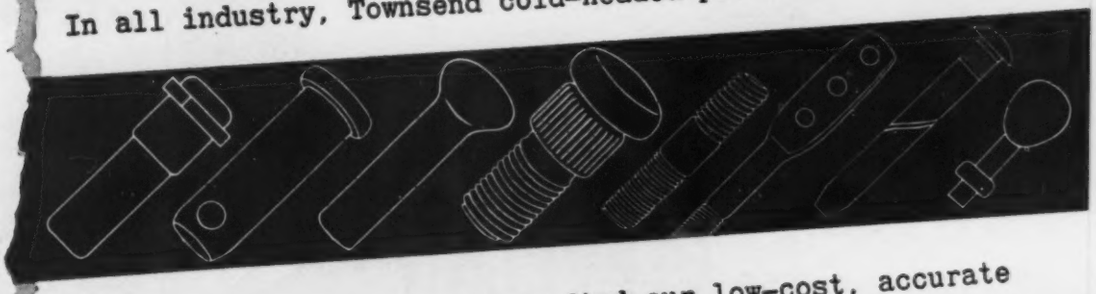
J. Piwowarsky

This novel Christmas card was Dr. Piwowarsky's means of conveying the seasons' greetings to his many friends in the States. —Ed.

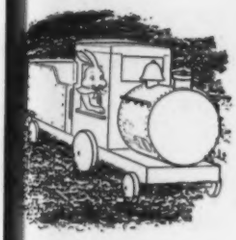
INQUIRY FROM JAPAN

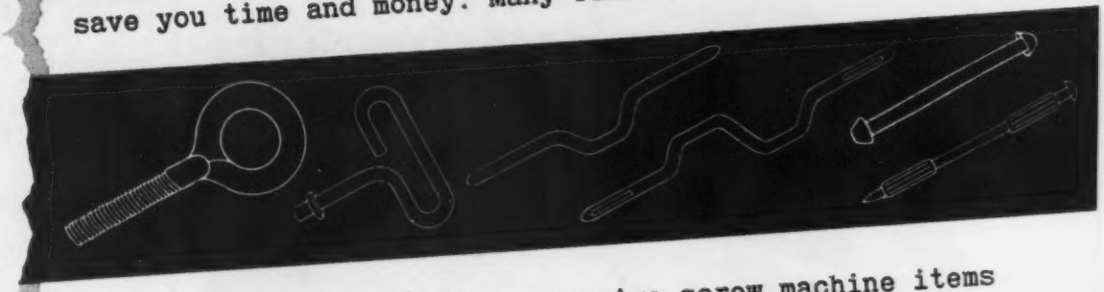
From the Free Publications section of the Oct. 13 issue, we are much pleased to learn that Bell & Gosset Co. is one of the famous makers of oil coolers in the United States. It is regretted that we cannot obtain any dependable oil cooler from our domestic manufacturers of sufficient capacity to cool 25 gpm of Navy

In all industry, Townsend cold-headed parts and fasteners

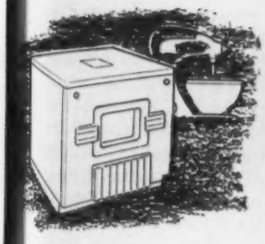


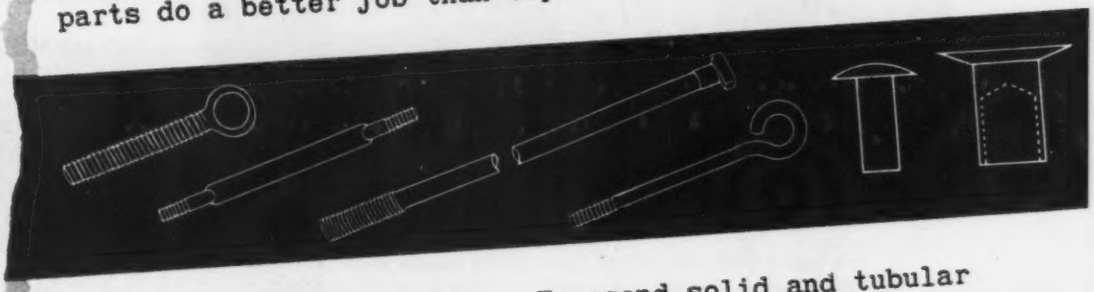
save you time and money. Many find our low-cost, accurate



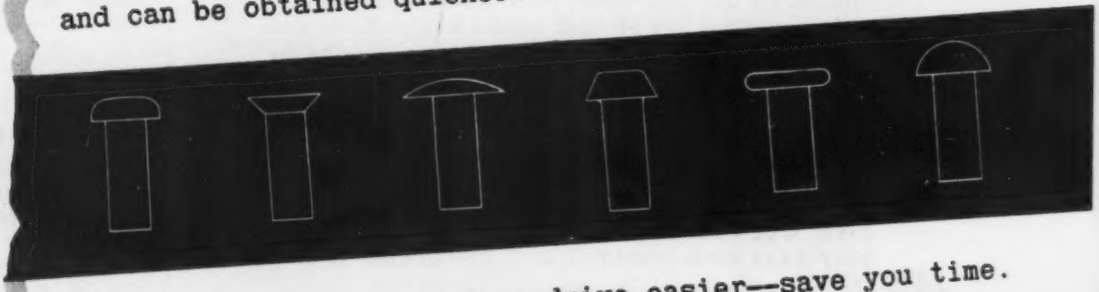


parts do a better job than expensive screw machine items

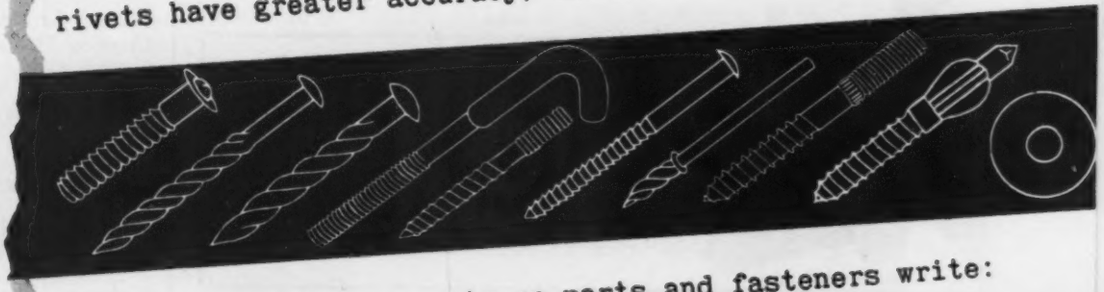




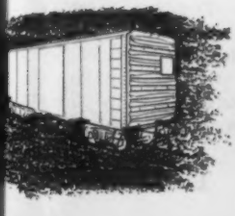
and can be obtained quicker. Townsend solid and tubular



rivets have greater accuracy, drive easier—save you time.



For help in reducing costs on parts and fasteners write:



New Brighton, Pa.
Chicago 38, Ill.

For EXTRA strong assembly—
EXTRA low fastener breakage
use CLEVELAND
High Carbon Heat-Treated
Cap Screws

It's good business to use these extra tough screws—for speed in the shop and strength in your finished product. You get the best that money can buy at only a slight increase over the cost of 1020 bright screws. Cleveland High Carbon Heat Treated Cap Screws are made by the Kaufman *Double Extrusion* Process—a method that assures you *extra* strong fasteners with *extra* close tolerance forming. Complete range of sizes from ¼ to 1½ inch diameter. It pays you to specify and buy Cleveland High Carbon Heat Treated Cap Screws.

THE CLEVELAND CAP SCREW COMPANY
2917 EAST 79TH STREET • CLEVELAND 4, OHIO
Warehouses: Chicago, Philadelphia and New York

When you need these "BRUTE" size
large diameter cap and set screws
(1⅛ to 1½ inch diameters)
Check with Cleveland
Many Sizes carried in Stock
1020 Bright and High Carbon Heat Treated

CLEVELAND
Top Quality
FASTENERS

ORIGINATORS OF THE
KAUFMAN DOUBLE EXTRUSION PROCESS
Specialists for more than 30 years in
CAP SCREWS, SET SCREWS, MILLED STUDS
Ask your jobber for Cleveland Fasteners

DEAR EDITOR

Continued

Symbol 1120, replacement for the Morgoil bearing lubricant on the U. E. made 4-high cold strip mill reducing tinplate gages, from 105°F to 85°F. We are much interested, therefore, to know how practically the products mentioned could be used in our oil system, and willing to go into any business arrangement with the company for us to purchase such equipment, provided the product proves satisfactory to us in every respect. We have attached the business reply card. Would you be good enough to give us any further information of the facilities.

U. MIYAZAKI
Chief Engineer
Toyokohan Co., Ltd.
Tokyo, Japan

Details, selection charts and graphs for the installation of B & G oil coolers are shown in catalog V-1146, which has been forwarded.—Ed.

RECOMMENDED READING

Allow me to comment very favorably on the clarity and common sense of the Dec. 22 editorial. I think it is very good and I am inviting all of our salesmen to read it. The steel industry has always been too apologetic about making a profit, and in normal times they still don't make the money they should. In all my steel experience I have never seen our fair-minded customers object to the steel industry making a profit.

W. H. WIEWEL
Vice President
Crucible Steel Co. of America
Pittsburgh

CLEARING HOUSE

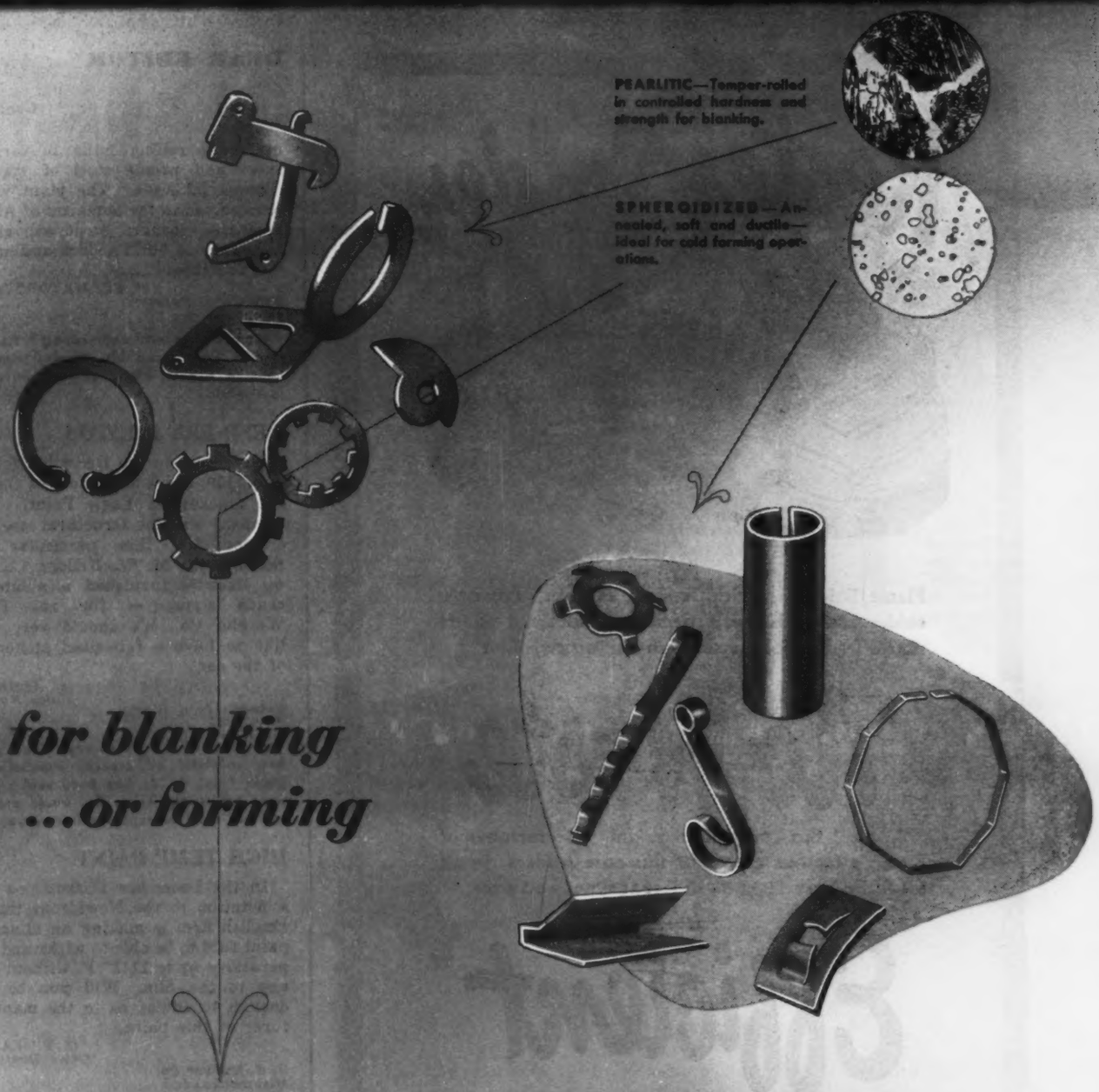
We have received a request from a client in Switzerland for a list of American firms dealing in second-hand machine tools so that he may prepare an itinerary for his intended visit to the United States in the immediate future. We believe such a list can be easily prepared from the Clearing House listings in your publication and therefore would appreciate receiving two recent issues containing these listings to forward abroad.

A. C. SHEEDY
Export Dept.
M. J. Corbett & Co., Inc.
New York

Copies of the December 15 and 22 Clearing House have been sent.—Ed.

GREEK STEEL MILL

I would appreciate your sending me a few addresses of engineering firms which could design and build a complete steel plant. The M. C. Stamatopoulos Sons Co., in cooperation with three other Greek companies, is planning to build a steel mill in Greece. The plant should have a 25-ton (metric) openhearth furnace and the


PEARLITIC—Temper-rolled in controlled hardness and strength for blanking.
SPHEROIDIZED—Annealed, soft and ductile—ideal for cold forming operations.

for blanking ...or forming

it's easier when you use **WEIRTON**

HIGH-CARBON STRIP

COLD-ROLLED SPRING STEEL

Either for blanking or for forming, there is a Weirton cold-rolled spring steel having special qualities and properties that make the operation easier to perform and make the manufactured product better. You will always get consistent results, too—because Weirton's close control over every step of manufacture assures constant uniformity.

You can count on Weirton High-Carbon Strip cold-rolled spring steel . . . for accurate response to heat treatment —uniformity of gauge and width—uniform chemical and physical properties—exact constancy of grain structure —controlled decarburization limits.

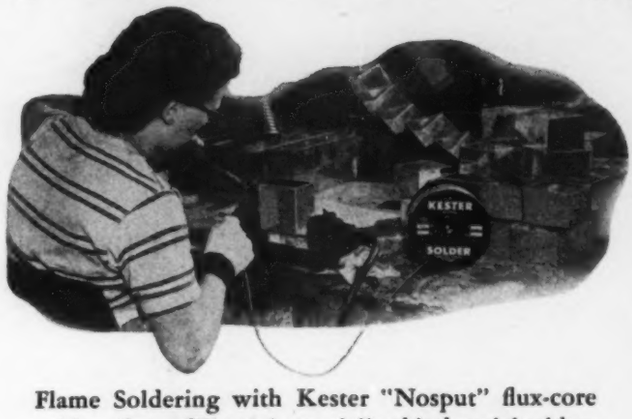
Weirton High-Carbon Strip is obtainable with the desired chemical analysis and for specific heat treating and hardness ranges, in widths up to seven inches.

WEIRTON STEEL CO.

WEIRTON, W. VA., *Sales Offices in Principal Cities*

Division of **NATIONAL STEEL CORPORATION** *Executive Offices, Pittsburgh, Pennsylvania*

Kester Solder



Flame Soldering with Kester "Nosput" flux-core solder. One of Kester's specialized industrial solders that does this job better than any other solder.

No Waste

"Nosput" flux-core solder is only one member of Kester's famous group of flux-core solders. In all there are over 100,000 different types and sizes.

Efficient

Kester can supply the right solder for the job, virtually eliminating waste and rejects. Call in a Kester expert and have him analyze your customers soldering operations.

Kester Solder Company
4201 Wrightwood Ave. • Chicago 39, Illinois
Newark, New Jersey • Brantford, Canada

Send for free manual:
"SOLDER and Soldering Technique"

KESTER SOLDER

Standard for Industry since 1899

DEAR EDITOR

Continued

necessary rolling mills to turn out sheet and profile steel of standard commercial sizes. The plant will be constructed in the outskirts of Athens, near the seashore, so it will also be necessary to build a dock and unloading facilities.

P. STAMATOPOULOS
Brantford, Ontario
Canada

Names of several engineering firms in the United States capable of designing and building a complete steel plant have been sent.—Ed.

REFINERY PHOTOS

Referring to the December 8 issue, page 109, there is a photo of the new cat cracker at Eagle Point. This company was the structural steel contractor for this particular unit through the M. W. Kellogg Co., and we likewise furnished a number of crude structures for the Foster Wheeler Co. We should very much like to have a fair-sized photograph of the cat.

S. S. ALBERT
Sales Manager
Belmont Iron Works
New York

A print of the photograph used of the new catalytic oil cracker installation at Eagle Point, N. J., has been sent. If you want others, the Texas Co. would probably be very glad to supply prints to you.—Ed.

HIGH TEMP PAINT

In the December 1 issue you have a notation in the Newsfront that an English firm is making an aluminum paint said to be able to withstand temperatures up to 1112° F. without damage to the film. Will you be kind enough to advise as to the manufacturer of this paint.

C. E. WARD
Chief Draftsman
U. S. Rubber Co.
Mishawaka, Ind.

The English firm making the aluminum paint is Atlas Preservative Co., Ltd., Frazer Road, Erith, Kent.—Ed.

STEEL PROFITS

The writer has been hearing a good deal, from people who do not know much about the matter, concerning the earnings of United States Steel and other steel companies. He remembers only too well the reports of losses between 1931 and 1940. Consequently, any information you might have on the subject of profits and losses of steel companies for 1930 to the present time, or a source for obtaining this information would be very much welcomed.

H. R. SCHNITZER
President
Schnitzer Alloy Products Co.
Elizabeth, N. J.

The American Iron & Steel Institute, 350 Fifth Ave., New York 1, is sending you profit and loss information on the various steel companies.—Ed.

FREE

PUBLICATIONS

Continued from Page 34

and automotive sub-assemblies. *Brandt Baltimore. For more information, check No.* 10 *on the postcard on p.* 35.

Dry Type Transformers

Dry type transformers for machine tool and lighting circuits available in 600-v capacities and below are listed and described in 4-p. Kuhlman catalog. *Kuhlman Electric Co. For more information, check No.* 11 *on the postcard on p.* 35.

Geared Scroll Chucks

The extra heavy duty line of Warner & Swasey 3-jaw geared scroll chucks in 8, 10, 12, 15, 18, 21 and 24-in. sizes, with serrated or American Standard jaws, are presented in illustrated 4-p. folder. *Warner & Swasey. For more information, check No.* 12 *on the postcard on p.* 35.

Swivel Joints

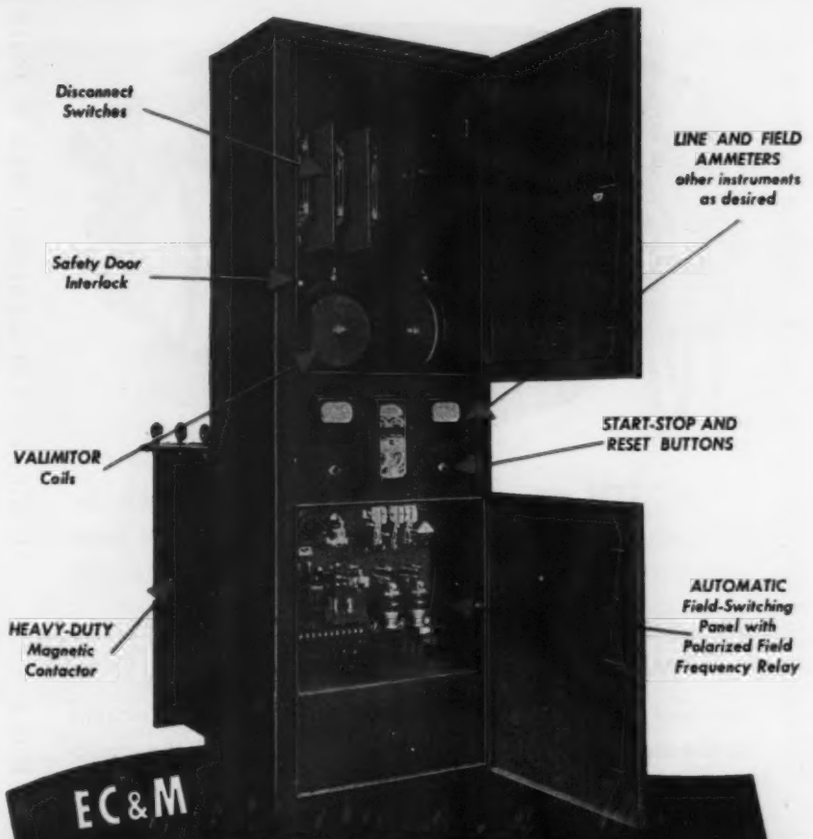
Over 500 different types and sizes of Chiksan ball - bearing swivel joints, with a breakdown into seven basic types for temperatures from −25° to 600°F, pressures from vacuum to 15,000 psi, and in size ranges from ⅜ to 12 in., are described in catalog No. 50. *Chiksan Co. For more information, check No.* 13 *on the postcard on p.* 35.

Screw Machines

Special applications of the Hardinge high speed precision machines for manufacturers of screw machine products are photo-illustrated in 4-p. pamphlet. *Hardinge Bros., Inc. For more information, check No.* 14 *on the postcard on p.* 35.

Clamp Truck

The use of an Elwell-Parker clamp truck to expedite the material handling problems of roll stock


Disconnect Switches
LINE AND FIELD AMMETERS other instruments as desired
Safety Door Interlock
START-STOP AND RESET BUTTONS
VALIMITOR Coils
AUTOMATIC Field-Switching Panel with Polarized Field Frequency Relay
HEAVY-DUTY Magnetic Contactor

EC&M
VALIMITOR STARTERS

for 2300-4600 Volt SYNCHRONOUS Motors
are complete in every respect

Motors are brought up to speed AUTOMATICALLY

Just press a button to start; the motor accelerates and pulls into step without delay. While the motor is running, protection is complete. The field is automatically removed should the motor slow down due to a voltage dip or overload. Re-synchronization occurs automatically if the motor can re-accelerate the load.

No need to calculate short circuit capability of the power system to which the motor is connected. EC&M VALIMITOR Starters give unlimited protection—the bus may be of any capacity—KVA may be infinite. Specify EC&M VALIMITOR Starters for 2300/4600 volt synchronous motors.

Write for complete facts—Ask for Nos. 21 & 23 Accelerator Bulletins.

THE ELECTRIC CONTROLLER & MFG. CO.
2698 East 79th Street • Cleveland 4, Ohio

OVER ONE HUNDRED YEARS OF CONTINUOUS SERVICE. ROUNDS, SQUARES, FLATS, HEXAGONS, OCTAGONS

BILLETS AND FORGINGS FOR PRODUCTION, TOOL ROOM AND MAINTENANCE REQUIREMENTS.

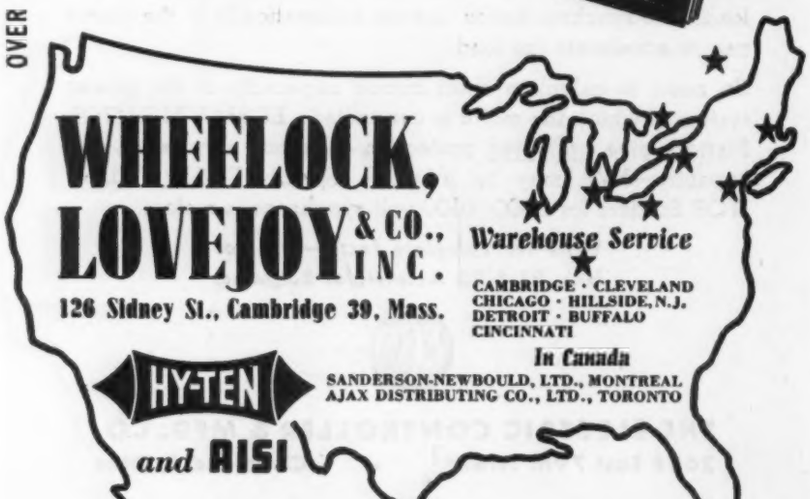
HY-TEN Alloy Steels are steels with their own specific properties and definitely different chemistry from standard AISI and SAE steels. They are *not* AISI or SAE steels to which a trade name has been attached.

HY-TEN Steels offer the advantages of the latest metallurgical improvements before they are incorporated in the standard groups. The HY-TEN of today is the standard steel of tomorrow.

HY-TEN is a guarantee of uniform chemistry, grain size, hardenability, etc.

HY-TEN *and* STANDARD AISI and SAE Steels are stocked in a wide variety of sizes, shapes, treatments and finishes, thus assuring prompt reliable steel service from WL's seven warehouses.

Write today for your FREE COPY of the Wheelock, Lovejoy Data Book, indicating your title and company identification. It contains complete technical information on grades, applications, physical properties, tests, heat treating, etc.



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HY-TEN and AISI

FREE PUBLICATIONS

Continued

up to 30-in. diam is illustrated in 8-p. booklet. *Elwell-Parker Electric Co. For more information, check No.* 15 *on the postcard on p.* 35.

Portable Floodlight

Light weight, portable, all-weather Circle D-150 floodlight designed for use in shipyards, docks, and industrial buildings for fire, storm, flood, and emergency work is described in data sheet. *Natale Machine & Tool Co. For more information check No.* 16 *on the postcard on p.* 35.

Precision Gear Hobber

The Hamilton No. 00 precision gear hobber for the high speed, continuous hobbing of small, precision spur gears, pinions and special tooth forms is described in 4-p. illustrated folder. *Hamilton Tool Co. For more information, check No.* 17 *on the postcard on p.* 35.

Material Handling

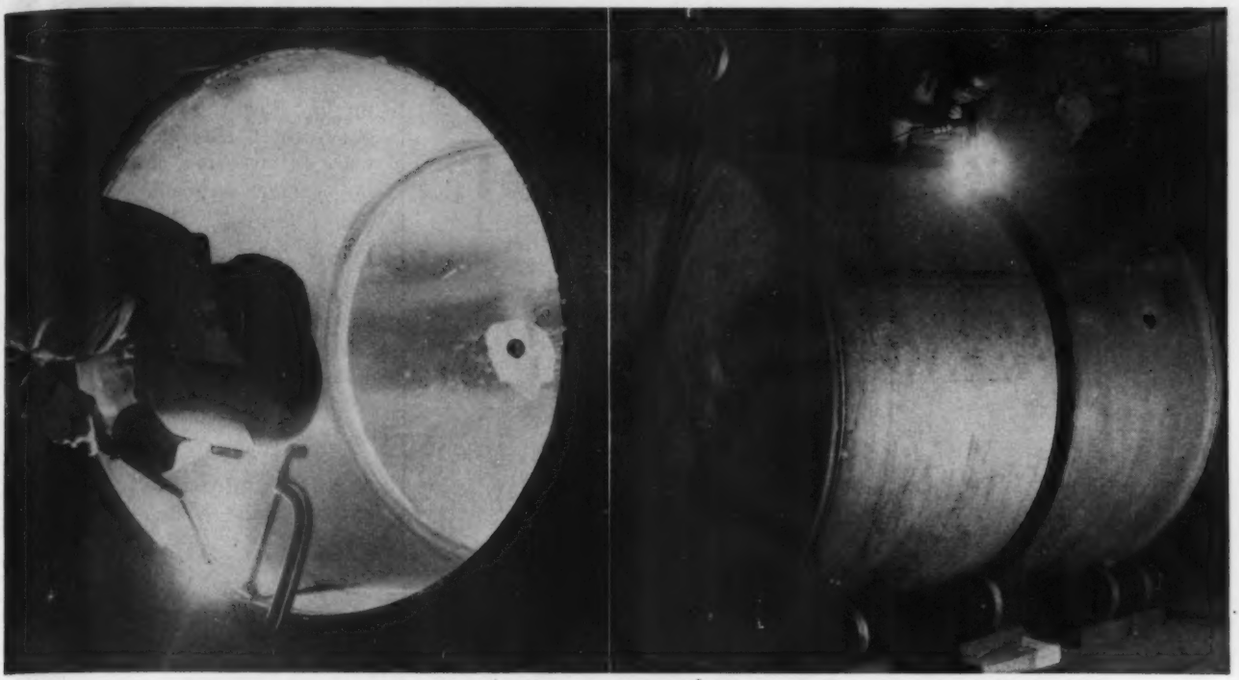
Industrial Logistics Handbook describes material handling techniques for operations such as machining, finishing, assembling testing, packing and warehousing, utilizing electric lift trucks. *Elwell-Parker Electric Co. For more information, check No.* 18 *on the postcard on p.* 35.

Electrical Insulation

Dow Corning Silicone electrical insulation, consisting of Mica, asbestos, Fiberglas and similar inorganic materials in built-up form, is described in a 4-p. bulletin illustrating many applications. *Dow Corning Corp. For more information, check No.* 19 *on the postcard on p.* 35.

Hydraulic Equipment

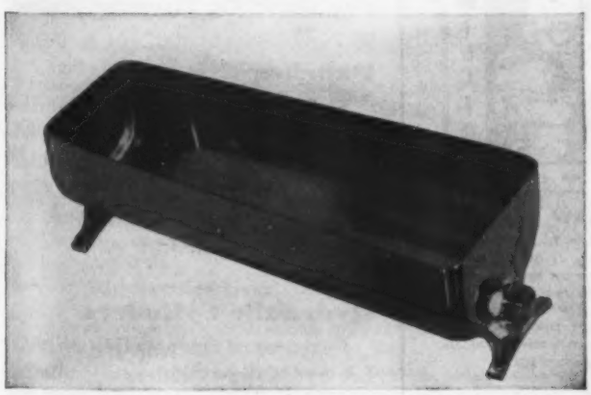
"Hy-Power Hydraulics" is the subject of a new 29-p. booklet describing use of hydraulic pressures up to 5000 psi for a wide variety of high speed production operations, including silent squeeze riveting, punching, pressing, multiple riveting and multiple punching, and contains detailed description and schematic diagrams of the Hanni-



Above left: Welding cylindrical tanks at S. Blickman, Inc., Weehawken, New Jersey, with new "Stainweld".
Above right: Downhand welding 18-8 stainless steel 1200 gallon still.

NEW LINCOLN ELECTRODES CUT STAINLESS WELDING COSTS

All types of stainless steel pressure vessels and containers are now being weld fabricated at lower cost with new, improved Lincoln "Stainweld" electrodes. As a result of newly developed coating, new "Stainweld" offers these cost cutting advantages:



Stainless steel trough shows high quality welds ground and polished. Courtesy S. Blickman, Inc.

- **Welds easier in flat, vertical and horizontal positions.**
- **Arc is more stable... simplifies welding in corners.**
- **Restriking is easier.**
- **Spatter is less... slag removal is better.**
- **Welds are more solid... greater freedom from pin holes.**
- **Bead surface is more uniform... needs less finishing.**

GET THE FACTS

Send for free Lincoln Weldirectory for Stainless Steel.
THE LINCOLN ELECTRIC COMPANY
Dept. 52, Cleveland 1, Ohio

LINCOLN

Sales Offices and Field Service Shops in All Principal Cities

"Sure, I'd wear a respirator . . .

. . . if it was comfortable!"

Respirator Style 45D

Respirators must fit properly and provide ease of breathing before workers stop risking their lungs—and your profits.

Protection must be combined with comfort. One without the other means a wasted investment in safety equipment. Here is a WILLSON lightweight respirator, approved by the U. S. Bureau of Mines for use in dusts and mists. It has gained wide acceptance in industry through workers' willingness to wear it. Normal breathing is assured through easily replaceable filters and a positive acting exhaust valve. The facepiece, in two sizes with adjustable wire nose spring and adjustable elastic headband, is adaptable to all face sizes.

NEW CATALOG

In addition to product information, it contains information on safety glass, filter glass, respiratory hazards, etc., which will help you select proper safety equipment to meet specific hazards. Send for it!

WILLSON

"Established 1870"

WILLSON PRODUCTS, INC., 231 WASHINGTON STREET, READING, PENNA.

FREE PUBLICATIONS

Continued

fin Hy-Power hydraulic pressure generator. *Hannifin Corp. For more information, check No.* 20 *on the postcard on p.* 35.

Pipe Threading Machine

Designed for jobbing and maintenance threading, the Little Landis pipe threading and cutting machine claimed to offer flexible, accurate, economical operation is described in 8-p. folder. *Landis Machine Co. For more information, check No.* 21 *on the postcard on p.* 35.

Aluminum Alloys

A booklet entitled "Revere Aluminum Products" contains complete descriptive information about the various forms in which Revere aluminum is fabricated, and includes illustrations of products using aluminum alloys in the form of extruded shapes, tube, and coiled sheet. *Magnesium-Aluminum Div., Revere Copper and Brass, Inc. For more information, check No.* 22 *on the postcard on p.* 35.

Radial Drills

Centralized controls covering 36 speeds and 18 feeds in new line of Super Service C-B radial drills are described in 16-p. illustrated booklet that includes photos, text and detail drawings. *Cincinnati Bickford Tool. Co. For more information, check No.* 23 *on the postcard on p.* 35.

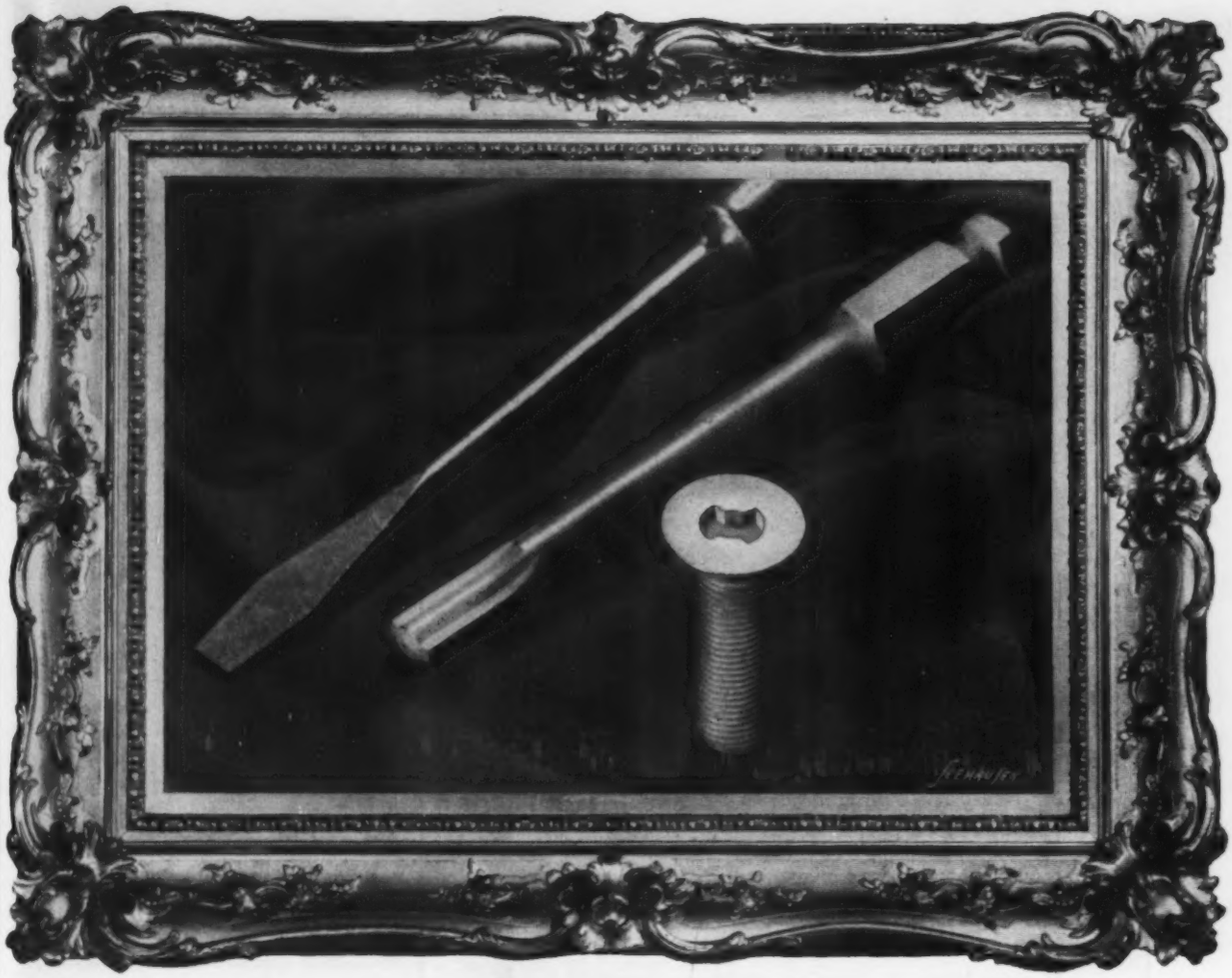
Punches

Six-page folder No. 222 describes features and lists prices of Pivot standard and whipsleeve shoulder punches. *Pivot Punch and Die Corp. For more information, check No.* 24 *on the postcard on p.* 35.

Hydraulic Cylinders

Features of the new line of series LA hydraulic cylinders include improved head seals, multiple piping connection positions, self-adjusting packings and adjustable hydraulic cushions, as described in the 28-p. bulletin 49-55. *Vickers, Inc. For more information, check No.* 25 *on the postcard on p.* 35.

Resume Your Reading on Page 35



Acclaimed a Masterpiece...

CLUTCH HEAD *Brightens the Profit Picture with 15% to 50% Assembly Increases*

Here is how CLUTCH HEAD'S modern design meets today's competitive selling problem of "*How to Produce More for Less*"...by effecting time and cost savings that quicken production steps all the way down the assembly line.

High Visibility of the roomy recess presents an easy-to-hit target. "Green" operators require no break-in. They drive with speed and confidence that checks out slow-down hesitation.

Chewed-up Heads Eliminated because dead-center entry with the Center Pivot Column prevents driver canting and makes straight driving automatic.

Safe Non-tapered Driving eliminates the danger of driver skidding from "ride-out" as set up by tapered driving . . . an important safety factor for the protection of manpower and material.

Zero in Skid Damage is reported by CLUTCH HEAD users. The all-square contact of the straight-sided driver with the straight-walled recess makes high torque driving almost effortless.

A Fatigue Factor Disposed Of. Absence of end pressure means safer, faster, easier driving. No end-of-the-shift lag means more screws driven for higher production.

Up to 214,000 Screws Driven non-stop by the Type "A" Bit . . . without interruption for tool change or reconditioning. Add to this record performance the fact that a 60-second on-the-spot operation restores this bit to original efficiency . . . *repeatedly*.

The Lock-On Overcomes Fumble Spots. A reverse turn of the bit in the recess forms a frictional hold that unites screw and bit as a unit. This permits quick, easy one-handed reaching to inner spots.

Speeds Field Service Too. With the Type "A" Hand Driver, field service men find it easy to withdraw "frozen" screws undamaged and safely held by the Lock-On on the end of the bit for re-use.

Common Screwdriver Operation. This is the *ONLY* modern screw with a recess basically designed for operation with a flat blade . . . which need only be reasonably accurate in width. Important to simplified field service.

CLUTCH HEAD SCREWS

These highlights of America's Most Modern Screw are fully detailed and illustrated in the NEW CLUTCH HEAD BROCHURE. *Send for your copy and indicate the sizes and types of screws that interest you.*

UNITED SCREW AND BOLT CORPORATION

CLEVELAND 2 CHICAGO 8 NEW YORK 7

HALLDEN
Automatic Shears

CUSTOM BUILT SHEARS FOR ANY APPLICATION

Hallden Automatic Flattening and Cutting Off Machines can be built into lines requiring special shearing applications.

Hallden Automatic Shears are designed to permit continuous feed of metal through the machine by synchronizing the flattener with the flying shear. Cutting accuracy can be held to plus or minus 1/64".

Hallden Shears are self-contained units which, under normal operation, require little maintenance other than lubrication.

Hallden's flexible design allows quick changing of shear knives and easy removal of flattening rolls for grinding. The shear knives always move in a mutual plane.

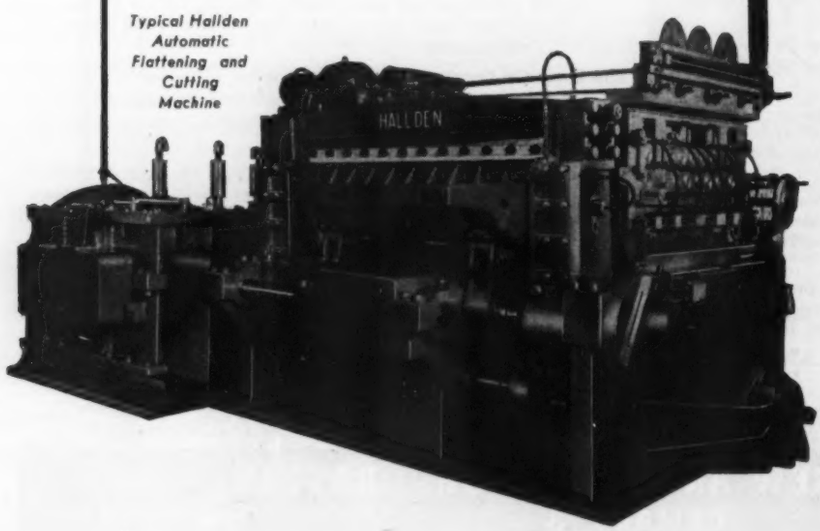
If you have a shearing problem, consult Hallden, *the shearing specialists.*

THE HALLDEN MACHINE COMPANY
THOMASTON, CONNECTICUT

Sales Representatives

The Wean Engineering Co., Inc., Warren, O.
T. E. Dodd, Pittsburgh, Pa.
W. H. A. Robertson & Co., Ltd., Bedford, England

Typical Hallden Automatic Flattening and Cutting Machine



NEW PRODUCTION IDEAS

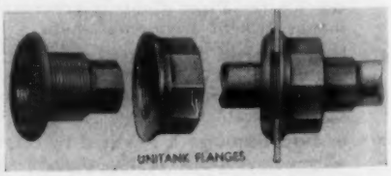
Continued from Page 38

Adjustable backstop and finger gages assure exact duplication of hole locations. A Hydra-New-Matic Head operates with a minimum of vibration and noise at 165 strokes

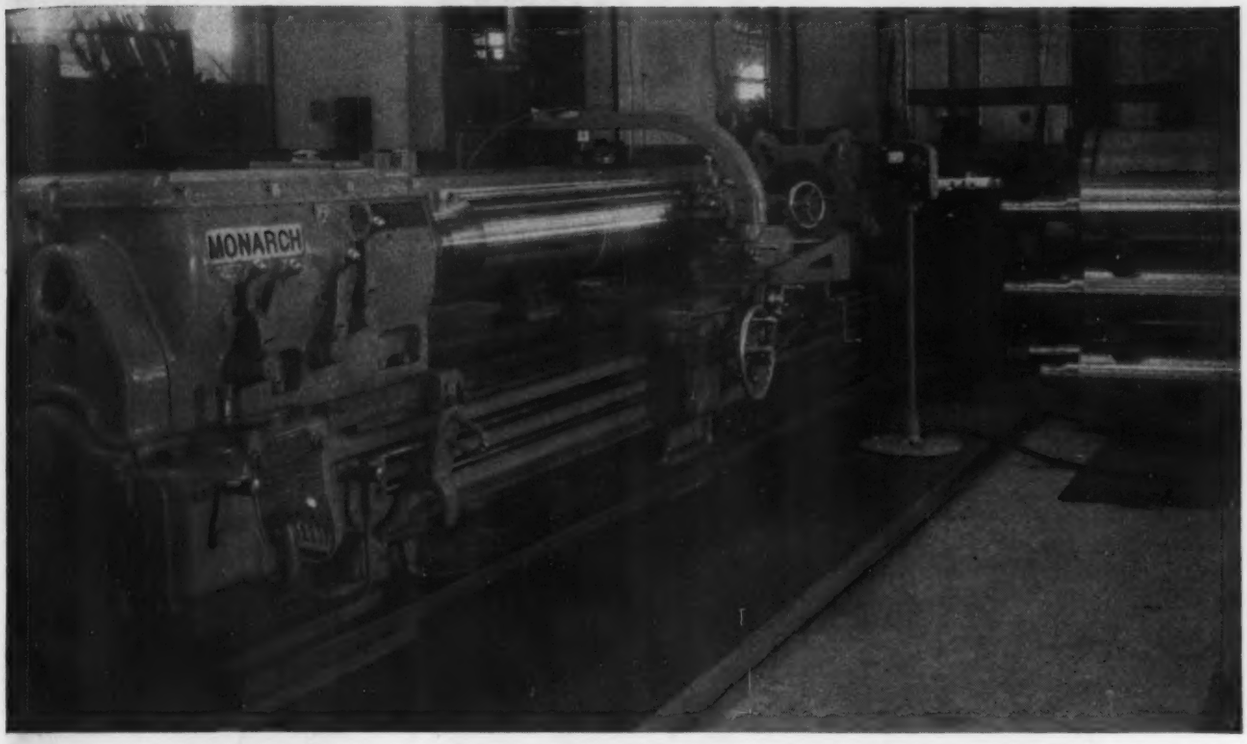
a min for single hole punching and nibbling. Dual control of the ram stroke is provided by an adjustable foot trip mechanism. *Wales-Strippit Corp. For more information, check No. 39 on the postcard on p. 35.*

Pipe-Tank Connection

A time-saving pipe-to-tank connection, the Unitank flange, used in conjunction with the Unitank flange cutter, provides a simplified method of connecting pipes to the outside or inside of a tank in a few minutes. The flange body, tapped both ends



and threaded outside, is inserted through a hole of the proper size from the inside of the tank; the outside piece, with one face flanged out and finished, is attached by means of a left hand thread. The flange is a machined malleable casting with a tensile strength of 50,000 lb. It is available in pipe sizes ½, 1, 2, 3, 4, and 6 in. The



TURNING TIME REDUCED 80%

Printing Press Rolls Machined in 1½ Hrs. Instead of 7½

One fifth of former time! That's the kind of "*peak production at a profit*" you can expect with Monarch's Air-Gage Tracer-controlled lathes.

But peak production is only part of the story. Accuracy is spelled out with a capital "A". On this job, for example, necks and body of the roll are turned complete, and shoulder spacing on the ends of the roll —88½" apart—is held to + .001" – .000"!

The combination of air-gage accuracy with Packaged Controls and carbide tools permits exact duplication of parts in floor-to-floor times that are second to none.

You can't beat the Air-Gage Tracer's low production costs, either. Single-point turning means lower tool costs, faster set-up times, less machine overhead. And lot size is no limitation: you can trace from a round or a flat template—whether you're turning out two or two thousand parts.

This duplication principle is ideally applicable for stepshafts, contours and taper turning or boring. It brings the speed of automatic lathe operation within reach of every production job. May we show you how it can cut costs in your shop?

JOB FACTS

Part: Printing Press Roll

Material: SAE 1045 Forging

Size: 107" x 14" Diam.

Machine: Monarch 25 x 144 Model N Engine Lathe equipped with Air-Gage Tracer and Packaged Controls

Tooling: Carbide Tipped

Operations: Turn Necks and Body complete

Tolerance: + .001" – .000" between Shoulders

Former Time: 7½ Hours

Monarch Time: 1½ Hours

ACCURACY · ECONOMY · LONG LIFE

Monarch TURNING MACHINES

THE MONARCH MACHINE TOOL CO. • SIDNEY, OHIO

FOR A GOOD TURN *FASTER* — TURN TO MONARCH

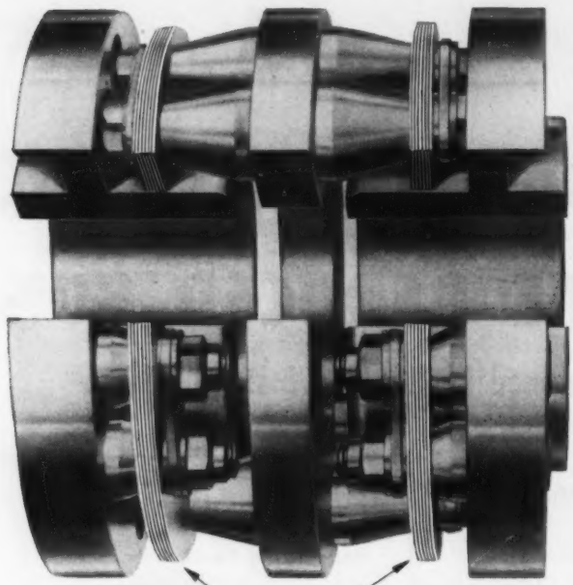
THOMAS *Flexible* ALL METAL COUPLINGS

FOR POWER TRANSMISSION • REQUIRE NO MAINTENANCE

Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

Thomas Couplings have a wide range of speeds, horsepower and shaft sizes: ½ to 40,000 HP — 1 to 30,000 RPM.

Specialists on Couplings for more than 30 years



PATENTED FLEXIBLE DISC RINGS

BACKLASH FRICTION WEAR and CROSS-PULL are eliminated LUBRICATION IS NOT REQUIRED!

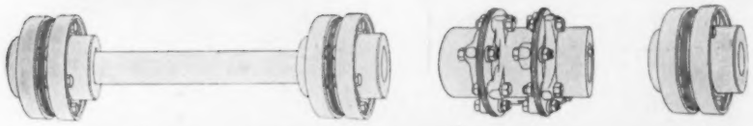
THE THOMAS PRINCIPLE GUARANTEES PERFECT BALANCE UNDER ALL CONDITIONS OF MISALIGNMENT.

• • •

NO MAINTENANCE PROBLEMS.

• • •

ALL PARTS ARE SOLIDLY BOLTED TOGETHER.



Write for the latest reprint of our Engineering Catalog.

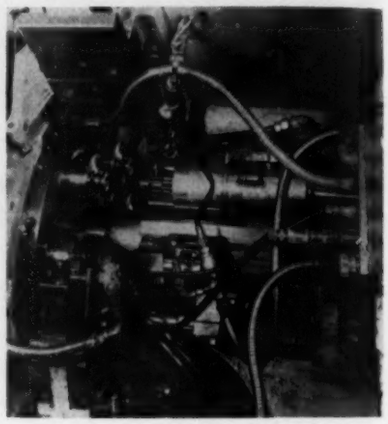
THOMAS FLEXIBLE COUPLING CO.
WARREN, PENNSYLVANIA

Continued

cutter operates on a simple combination punching and shearing can-opener principle, and cuts steel up to 3/16 in. thick. *American Pipe & Steel Corp. For more information, check No. 40 on the postcard on p. 35.*

Gearless Drill Head

An eight-spindle Zagar gearless drill head used on an Acme-Gridley 1¼ in. RA screw machine drills eight 5/16 in. holes in steel. The operation is performed during the general cycling of the machine prior to the part being cut off. The head itself rotates with the stock, and

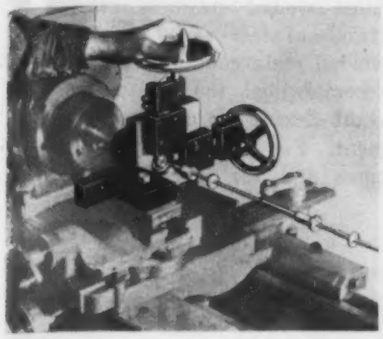


the drills are turned relative to the stock in order to perform the drilling operation. The same type of equipment can be installed on practically any automatic or hand turret lathe. *Zagar Tool, Inc. For more information, check No. 41 on the postcard on p. 35.*

Turnomat

The Karge Turnomat, a precision lathe and screw machine attachment for automatic turning to extremely close tolerances in a single cut, is now being manufactured by Todd since the acquisition of the patents and the manufacturing and distribution rights. The Turnomat, claimed to turn down slender shafts and tubing to tolerances of tenths of a thousandths, is said to be able to handle work of long lengths and to machine them to a surface accuracy approaching that of polishing and grinding. The Turnomat can be used for turning plastics,

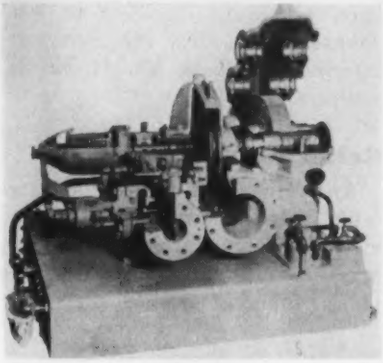
fiber, and rubber as well as metals, and can fit many sizes of lathes or screw machines. In addition to turning it will center to extreme



accuracy, drill, ream, tap, thread, thread chase and taper. *Todd Co. For more information, check No.* 42 *on the postcard on p.* 35.

Steam Turbines

Pumps, fans, compressors, and generators can be driven at their proper speeds by the new Type E industrial steam turbines with close-coupled, integral reduction gears for low-speed applications. The units combine a rugged, compact speed reduction mechanism solidly coupled to the Type E turbine and designed to operate as a

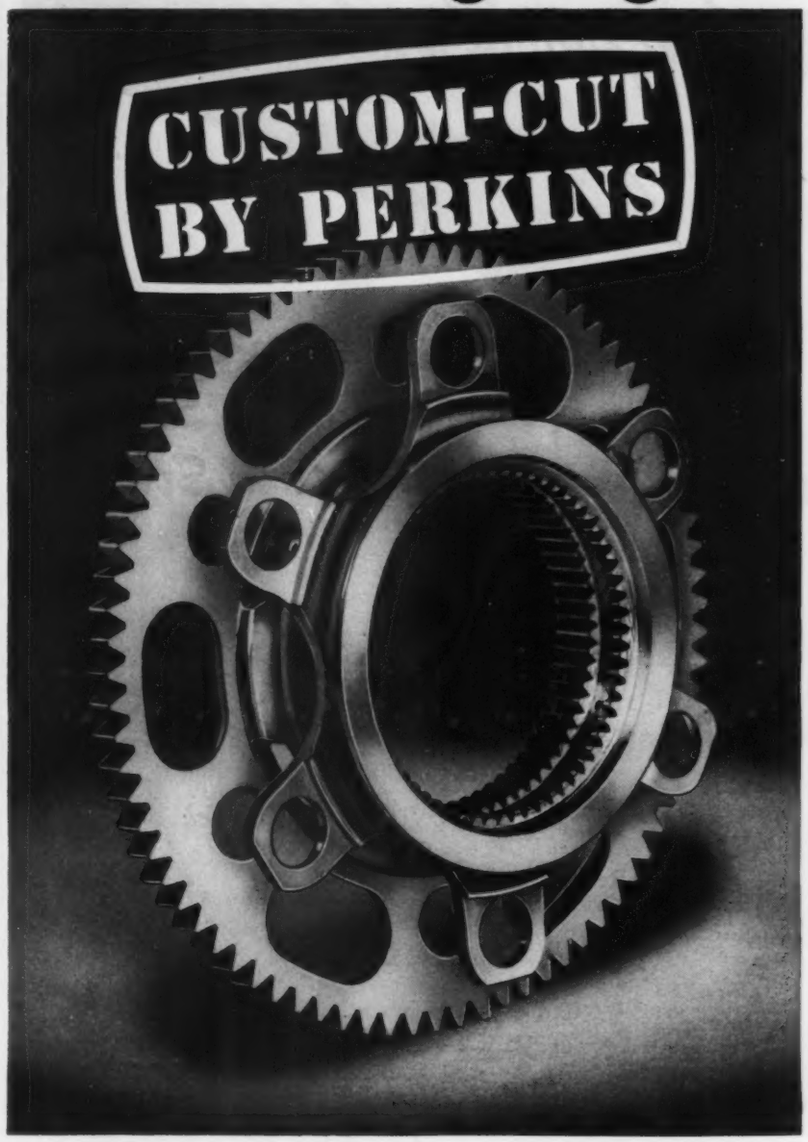


single unit. Three machined feet form a firm three-point support for the unit. Turbine and gear are factory aligned on a single, heavy plate steel base that also serves as an oil tank. *Westinghouse Electric Corp. For more information, check No.* 43 *on the postcard on p.* 35.

Flexible Stainless Hose

Flexible stainless steel hose for use under extremely high temperatures and for conveying under pressure or vacuum, materials corrosive to ordinary bronze seamless hose,

AIRCRAFT engine gears



The highly complex gear shown here, is an example of the exacting production jobs entrusted to us regularly by many of the country's leading manufacturers of aircraft engines. Moreover, our ability in the field of gear engineering extends into practically every industry. Thus a vast amount of *all* types of equipment in use right now has been built at less cost and operates more efficiently because Perkins' engineers checked the customers' blueprints and specifications prior to manufacture.

Broad experience both in the application and manufacture of all types of gears has equipped our staff to bring to your project a highly specialized knowledge of power transmission problems.

For the manufacture of the highest quality gears in production quantities, consult PERKINS first.

PERKINS MAKES—in all materials, metallic and non-metallic—Helical Gears, Bevel Gears, Ratchets, Worm Gears, Spiral Gears, Spur Gears with shaved or ground teeth, Ground Thread Worms

PERKINS MACHINE & GEAR Co., West Springfield, Mass.

WITH

MicroRold Stainless Steel Sheet and Strip

IF you want stainless steel having

★ More area per ton

or

★ Equivalent area weighing 3% to 8% less

or

★ Unusually high physical properties

or

★ Reduced polishing costs

AND

IF you are interested in savings in cost of $152.00 per 100 sheets of polished 18 gauge———————

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WASHINGTON STEEL CORPORATION
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WASHINGTON, PENNSYLVANIA

Please tell me more about

☐ MicroRold's savings in fabricating

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119 WOODLAND AVENUE
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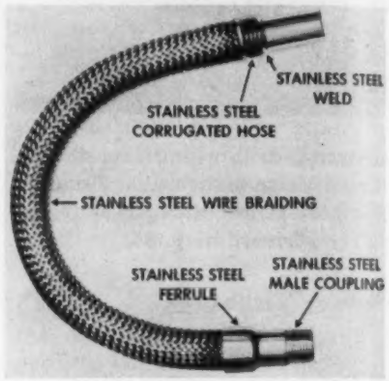
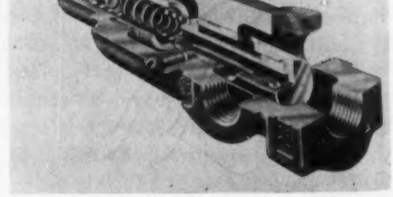
is manufactured in several types. Close wound stainless steel hose stainless steel wire braided with welded male couplings attached is recommended for use under constant flexing or continuous movement. For misalignment connections and for infrequent flexing,



open wound hose is used. Close wound stainless steel hose unbraided with stainless steel welded male couplings attached is for low pressure constant flexing applications. Sizes range from ¼ to 1½ in. ID; minimum bending diam 6½ to 18 in.; maximum working pressure, single braid, 2600 to 800. *Johnson Metal Hose Inc. For more information, check No. 44 on the postcard on p. 35.*

Relief Valve

An adjustable differential type relief valve, known as the VR series, is designed for use in high pressure, oil-hydraulic control systems. Inherent design character-

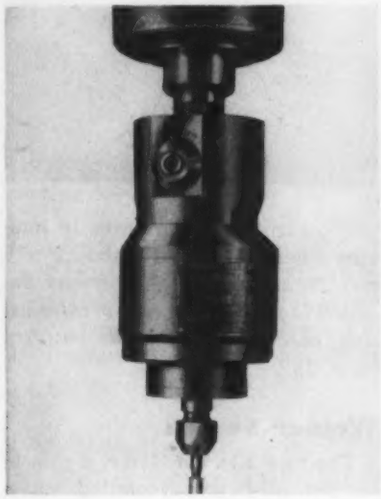


istics have eliminated valve chatter. The differential piston is said to reduce the effective area of the main poppet valve without reducing actual flow area, allowing use of lighter springs, with resultant accurate control and longer spring

life. Capacities range from 5 to 80 gpm and in pressure operating ranges between 400 and 1650 psi. *Hydraulic Equipment Co. For more information, check No.* 45 *on the postcard on p.* 35.

Turbine Hole Grinder

A precision hole grinder, that utilizes a high speed air turbine motor mounted on a Chandler boring and facing head, works on a line pressure of 100 psi and rotates at 50,000 rpm. It is designed for use on jig borers, vertical and horizontal milling machines, boring mills, lathes, surface grinders, internal grinders, and drill presses for the accurate production of finish ground holes. Vernier calibration permits reading of off-center head adjustment to 0.0001 in. Utilizing the fact that compressed air rotating the turbine cools as it expands, this machine automatically cools itself and can run indefinitely at its normal speed of 50,000 rpm without overheating. *Onsrud Machine Works, Inc. For more information, check No.* 46 *on the postcard on p.* 35.



Car Shaker

Railroad cars of coal, ores, sand, cinders, rock, coke, slag, wood chips, limestone, clay, or any other loose material may be easily emptied by one man in a matter of minutes through use of new Lo-Hed car shaker that features double safety through use of interlocking controls. The Lo-Hed car shaker cannot be operated until the shaker

A specialized compound
for every burnishing job

No matter what metals you burnish, or what media you use, Wyandotte can supply you with the *right* burnishing compound for the job.

Wyandotte Burnishing Compound 317, for example, is recommended for ball burnishing zinc, nickel or Monel metal parts. This liquid, soapless compound gives a bright, smooth finish, rinses freely and leaves no scum on the work or in the barrel. It is efficient and economical to use in even the hardest water.

Wyandotte Burnishing Compound 321 provides a brilliant luster to parts of brass, copper, bronze, stainless or carbon steel. A soap-type compound, it may be used for ball burnishing or for combined burnishing and burring with chips or stones.

If you'd like complete technical information on these and other burnishing compounds in the complete Wyandotte line, just call your nearest Wyandotte Representative or write direct to:

WYANDOTTE CHEMICALS CORPORATION
WYANDOTTE, MICHIGAN
SERVICE REPRESENTATIVES IN 88 CITIES

Wyandotte
REG. U. S. PAT. OFF.

SELECT A Sterling THAT FITS YOUR JOB!

There's a Sterling Barrow for every type of hauling job, whether it's dry, bulky materials like sawdust or heavy industrial loads like castings or steel parts. Also special barrows for brick, tile, coal, concrete block and similar materials. All barrows are scientifically designed, well balanced and sturdily constructed for a long service life. Choice of wood handles or tubular steel frame, steel wheels or pneumatics. Write for new Sterling Wheelbarrow Catalog No. 61.

(Above)
Model S-3 Maximum Capacity 3½ cu. ft. 16 gauge tray, all welded, no rivets, double lapped at corners. Steel channel legs. V-shaped front braces and brace support.

(Right)
Model S-19 Maximum Capacity 5 cu. ft. 16 gauge tray, all welded, no rivets, double lapped at corners. Heavy-duty malleable wheel guard.

12 SPOKE STEEL WHEEL

PNEUMATIC TIRED WHEEL

IMMEDIATE SHIPMENT

STERLING WHEELBARROW CO., Milwaukee 14, Wis.

Look for this Mark of STERLING Quality

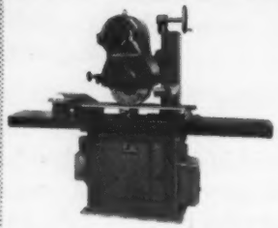
Sterling WHEELBARROWS

A 5714-3½

ROTARY AUTOMATICS • SEMI-AUTOMATICS

• STRAIGHT LINE AUTOMATICS •

ACME *Polishing and Buffing Machines* • CUT COSTS!



The ACME SQUARE TUBE *Machine*

This Automatic Machine is designed for polishing and buffing square, hexagonal, round or oval tubing and is highly efficient.

Tubing is loaded on mandrels. Work can be made to revolve continuously or automatically indexed 45-60- or 90 degrees at end of each stroke to finish next side of tube. Maximum stroke 48" to finish work up to 42". Handles up to 8 tubes at one time.

SPECIAL MACHINERY AUTOMATIC BUFFING MACHINES

ACME *Manufacturing Co.*

1645 HOWARD ST. DETROIT 16, MICH.

Builders OF AUTOMATIC POLISHING AND BUFFING MACHINES FOR OVER 35 YEARS

is in position; conversely, the motor trolley cannot be started when the shaker is in operation. This shaker, offered in combination with a 5-ton, twin hook hoist with controls, or with a single hook 5-ton hoist

and controls, empties cars in minutes where it formerly took 2 to 6 men from 2 to 6 hr. *American Engineering Co. For more information, check No. 47 on the postcard on p. 35.*

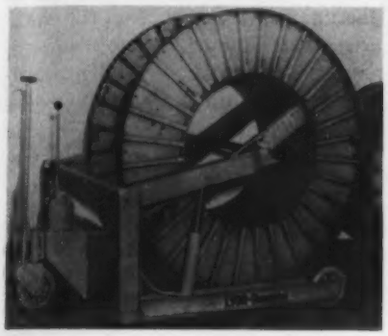
Welder Switch

The new Electro-Mizer, a remote start-stop switch mounted on a stand, provides finger touch control and greater efficiency and economy to welding operation. When the electrode holder is hung up, its weight shuts off the arc welding machine, and when it is picked up, the machine automatically starts. Thus, the welder runs only when welding is being done. The unit can be connected to any motor-generator welder having push-button starting. In addition to the electrode holder, it provides a convenient place for a remote control rheostat, electrodes, chipping hammer

and wire brush. *Hobart Brothers Co. For more information, check No. 48 on the postcard on p. 35.*

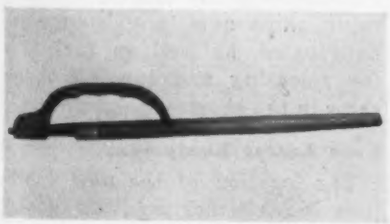
Cable Reel Truck

A cable reel truck handles reels of various diameters and widths without requiring any adjustment. One used for large reels will also handle smaller ones. The lifting arrangement incorporates two hydraulic hoists that raise the carrying arms. A single speed hydraulic hand pump provides the power. A popular model of 4000 lb capacity has a 23-in. lift and will handle reels from 24 to 60 in. diam and up to 36 in. wide. Other trucks can be furnished in 2000 to 10,000 lb capacities. *Lyon-Raymond Corp. For more information, check No. 49 on the postcard on p. 35.*



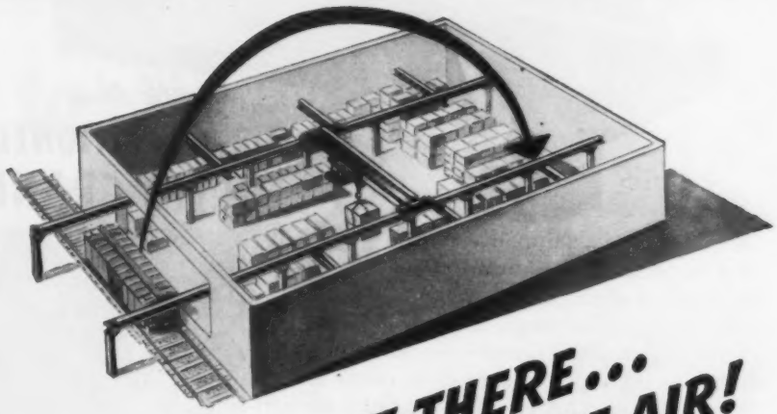
File Handle

A file handle for use with flat or half round files fits all sizes from 8 to 16 in. long. It may also be used with carpenter's rasps. Since filing is done with a planing motion, uneven and corner rounding is eliminated. Handee-Guide file handle has a tapering groove into which the shank of the file slips. A tap on the file is claimed to secure it firmly. The handle is designed to fit the hand and fingers comfortably. *Riverview Foundry Co. For more information, check No. 50 on the postcard on p. 35.*



Resume Your Reading on Page 39

FOR GREATEST ECONOMY OF SPACE AND MANPOWER



PUT IT THERE... THROUGH THE AIR!

A quick hook-on to a pallet, basket or standard sling and the load is whisked away—cutting across occupied floor space—straight to the spot where you want it.

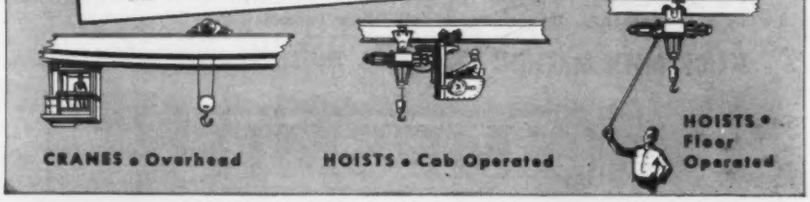
It's smart, and thrifty to use "through the air" transportation as widely as you can in plants and warehouses. Compare this method for overall cost, efficiency, maintenance and safety before you allow other means of transfer to overlap the service that is best performed by cranes and hoists!

Let the Shepard Niles specialist break your problem down for you—he's experienced, skillful and he has the maximum number of sizes and types in his product line.

Shepard Niles

CRANE & HOIST CORPORATION

Makes and sells all three lifting tools for airborne shop loads



356 SCHUYLER AVENUE • MONTOUR FALLS, N. Y.

FUMES and HEAT present NO Operational Problems

with this AIR CONDITIONED EUCLID CRANE

Designed and equipped especially for efficient operation over furnaces or other equipment and machinery where high temperatures and noxious fumes are present. An air-conditioning unit removes dust, cools the air and neutralizes fumes with activated carbon filters. Other special features include: slip ring motors with glass insulation and thermo guards; protective baffle plate under trolley and thermo pane windows.

Side view of cab showing air-conditioning unit mounted above on catwalk.

Write for complete information and specifications.

EUCLID CRANES AND HOISTS Raise Profits

THE EUCLID CRANE & HOIST CO.

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Save Money by Buying Your SCREW MACHINE PARTS from KEMPSMITH

Now — You can get high-quality screw machine parts from a reliable manufacturer at a substantial saving. In the modern, well-equipped Kempsmith plant, you will find a battery of six spindle automatics from 9/16" to 3½" diameter and single spindle machines from 9/16" to 6¼" diameter. Also plenty of hobbing, splining, broaching and other second operation equipment. These high-speed, precision machines are available to YOU for producing your screw machine parts. They enable you to get costs down to meet competitive bids. All metals can be processed. Send us your blueprints. Our quotation will follow immediately.

KEMPSMITH MACHINE CO., 1861 S. 71st ST., MILWAUKEE 14, WIS., U. S. A.

KEMPSMITH

Supplying the Needs of Industry Since 1888

B & O Building New Pier To Handle Imported Iron Ore

Orders for material already placed; construction to begin soon.

Baltimore — Early construction of a new, modern pier, to be located in the Port of Baltimore and designed primarily for the handling of import ore, was announced recently by The Baltimore and Ohio Railroad. Orders have been placed for much of the necessary material, and construction work will begin shortly.

The job will cost upwards of $5 million. It will require about 12 months to complete and will be ready to handle a heavy movement of ore as soon as it begins to arrive in the port early in 1951.

The new pier will be located along Stone House Cove, adjacent to the Baltimore and Ohio's large export coal pier at Curtis Bay. Representatives of the steel interests have pronounced the location as the best in the harbor.

Will Handle Iron Ore

The pier will be used for the handling of bulk import ores—iron, manganese and chrome—and is expected to be the largest and fastest at any seaport. It will be the first facility of its kind to be built by any railroad on the Eastern Seaboard. Berthing space and channel depth will be provided to accommodate the largest ore-carrying ships now in existence or anticipated, as well as facilities for releasing and turning these ships in the shortest possible time.

Uses Latest Equipment

The location of the new facilities is particularly advantageous in its proximity to the B & O Curtis Bay coal pier and its supporting yards. Here the daily unloading of coal makes available a large number of empty cars for quick switching to the adjacent ore facility for loading and assembly into solid ore trains for movement directly to steel plants in Ohio and Pennsylvania.

The facility will be equipped with ore unloading rigs of the latest design. A belt conveyer will

transport the ore to a battery of hoppers constructed over loading tracks. These hoppers will be equipped with automatic weighing devices for the accurate weighing of ore as it is discharged into railroad cars.

Empty cars will be placed under the loading hoppers by electric pushers, which will also push the loaded cars to adjacent tracks where they will be made up into solid trains for movement to destination.

The new facilities will be electrically operated with the latest type automatic and semi-automatic controls, limit switches, etc. The rated capacity of the facility will be approximately 3000 tons per hour, thus assuring a quick turnaround for the ore ships.

The entire layout has been designed so that its capacity can be doubled as soon as justified by the increased volume of import ore.

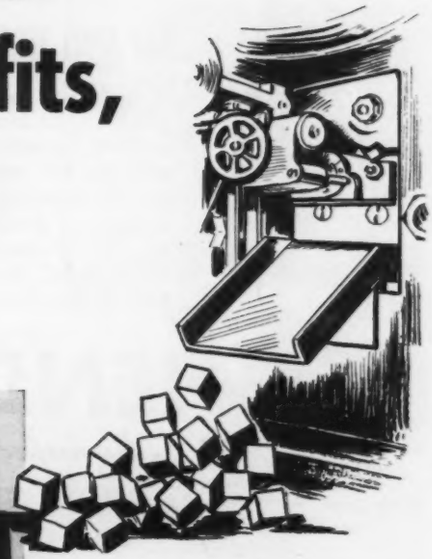
Building Parts Warehouse

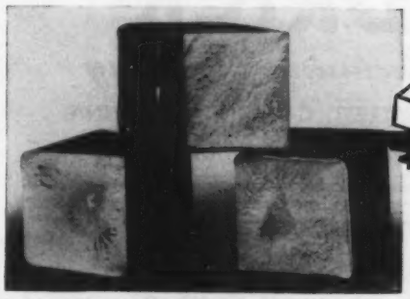
Detroit — A new Lincoln-Mercury parts depot will be located on a 45-acre site on Telegraph Rd. in Detroit. Plans call for erection of a two-story office building in conjunction with a one-story warehouse between Schoolcraft and Plymouth roads in Redford township. Approximately 575 persons will be employed in the warehouse which will service the Central Region sales office, the Detroit district sales office and the head offices of the Parts and Accessories and Service departments of Lincoln-Mercury.

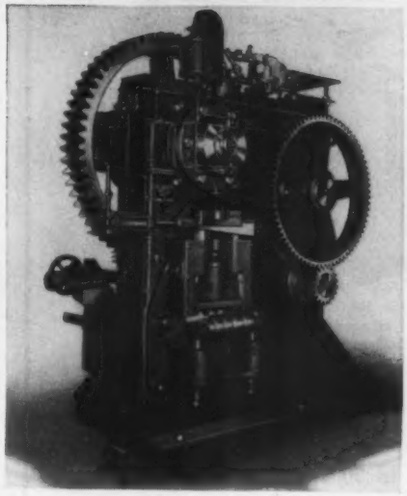
Enters Industrial Power Field

Detroit—Ford Motor Co. is entering the industrial power field in January. The company is offering two six-cylinder models, two V-type eight-cylinder models and one four-cylinder engine for industrial use. The units are equipped with radiator, instrument panel and SAE or Ford type housings. The units may be ordered with or without clutch, power take-off and three, four or five-speed transmissions.

CLEAN, QUICK CUTS to *"Pile Up"* Your Profits, Too!







with "Buffalo" BILLET SHEARS

If you could see the No. 17 Shear "bite off" SIX 9" squares (.20 C. steel) in a minute, you'd see how this speed "piles up" profits! And "Buffalo" Billet Shears are built to CONTINUE delivering this fast, powerful shearing action—many are still on active 24-hour service after a good many years. A complete range of 11 sizes to meet your most particular requirements on flats, angles, channels, squares and rounds. For instance, for high production work "Buffalo" Billet Shears can be arranged for Multiple cutting, like the No. 10 shown at the right, which has air-operated clutch, counterbalance and automatic hold-down.

Write for Bulletin 3295-A

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Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

Do you use Perforated Metal?

If perforated metal is required for any of your products, let Hendrick quote on fabricating it to your specifications. An unsurpassed stock of tools and dies, and ample plant facilities, enable Hendrick to give unexcelled service in furnishing perforated metal with any shape or size of openings, from any commercially rolled metal, in any desired gauge. Write for full information.

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Roll Forming Machines . . .

Type H—Outboard or Overhung
—All Steel Construction

*Formerly McKinney—WITH ARDCOR IMPROVEMENTS

★ ARDCOR All Steel Constructed Roll Forming Machines are built in standard sizes to take material up to 15 inches in width and 1/8 inches thick. Larger sizes, taking up to 50 inches in width are regularly supplied. Consult our engineering department without obligation.

ARDCOR SPECIALTIES

ARDCORLOY ROLLER DIES ● ROLL FORMING MACHINERY ● FLYING SHEAR AND CUT-OFF MACHINES ● CRADLE REELS ● SPECIAL PRODUCTION MACHINERY

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Business Experts Predict Continued Prosperity for 1950

Los Angeles—Continued prosperity but greater moves toward inflation were predicted by experts from throughout the nation at the second annual business conference sponsored by the Los Angeles Chamber of Commerce.

Henry H. Heimann, of New York, executive manager of the National Assn. of Credit Men, said that business will vary little in 1950 from the record of last year.

Construction and automobile industries will set the pace for business in the year ahead, he forecast, with the former slated for another record year and the latter moving into a more normal and competitive market as the year progresses.

The oil industry will have some trouble. Chemicals will be in better shape. Airplane production will improve.

He termed the November election crucial in the nation's trend.

Dr. Edwin G. Nourse, economist who was chairman of the President's Council of Economic Advisers, was outspoken in concern about underlying financial or fiscal uncertainties. He believes that even with prosperity in 1950, the country will be "in a shaky condition" because of deficit spending.

Milton J. Brock, veteran construction man, predicted a prosperous 1950 for his industry with about 75,000 homes to be built in this area during the year. He said there are 20,000 housing units now under construction with loans for an equal number more being processed by the Veterans Administration.

Produces New Shovel Tooth

Auburn, Wash. — Baer Steel Products Co. has recently announced a new replaceable shovel tooth made of Pacific Car & Foundry Co.'s new steel called "Fibraloy."

This tooth is said to lock rigidly into place and to give much longer wear than the usual unit. Fibraloy is reportedly of exceptionally high strength and shock resistant at higher hardnesses than usual.

German Plant Dismantling Appealed to the White House

Washington — A last-ditch attempt to halt the dismantling of the Hochfrequenz high-alloy steel plant at Bochun (on the Ruhr) has been made by direct appeal to the White House in the form of a petition signed by the plant employees.

Capacity of the plant is only about 6000 tons a year, it is pointed out. But, it is argued, dismantling would cripple a number of key West German plants. Also, completion of three power plants in the western section of Berlin would be halted or delayed, leaving the only source of power in Soviet-controlled East Berlin.

Dismantling had originally been scheduled because it was said to have made blades for jet aircraft. In early 1947, however, it was removed from the dismantling list and about four million marks spent in repair.

Last May, the British notified the plant that dismantling would begin in July but postponed the date on intervention of American Congressmen. A month or so later, actual dismantlement began and was about 50 pct complete by January 1950.

Increases Generating Capacity

Los Angeles—When it completes its program near the end of 1951, the Southern California Edison Co. will have spent approximately $300 million in expansion to take care of the increased electrical needs of industry and homes in this area, it has been disclosed by W. C. Mullendore, company president.

The company plans to spend $51,500,000 during this year for new plant and replacements. This is approximately $15 million less than spent last year.

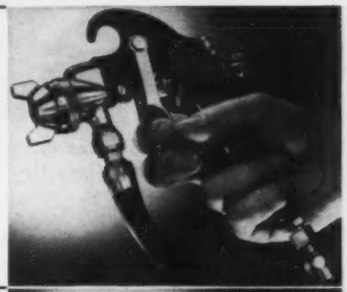
By the end of 1951 the Edison Co. will have increased its generating capacity by 589,000 kw over the wartime level. Of this, 505,000 kw already have been added with more than 80 new substations and 4000 miles of new transmission and distribution lines.

FOR EVERYTHING IN SPRAY PAINTING

3 ways to better finishes... faster

1st way... use a Model 18

latest addition to the Binks line... a precision gun for obtaining the finest finishes possible at the lowest cost. In designing this gun, Binks asked users what they wanted in a spray gun. Model 18 is the answer.

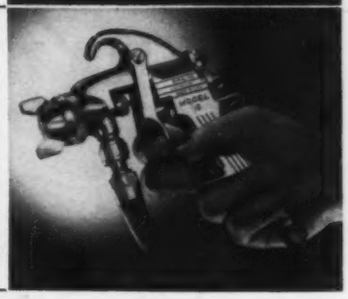


2nd way... use a Model 7

a heavy-duty production gun. This is a long time favorite with wide acceptance in the finishing field. Gun body is drop-forged aluminum with a tough, black electrolytic coating. All parts are of long lasting, wear resistant materials.

3rd way... use a Model 19

a truly remarkable, lightweight production spray gun, employing the same nozzles as Model 18. Reduces fatigue. Body is nickel-plated aluminum. Cartridge-type air valve is economical, easily replaced as a unit.



Binks "Big 3" spray guns are the favorites of industry everywhere. They lead the way to better finishes... faster. When Binks precision-made guns are on the job, you will have finer finishes; rejects will be cut to a minimum; production will be greater; finishing costs, lower.

Take hold of a Binks spray gun. Feel its perfect balance. Note the convenient back-of-gun location for controls... the precision construction of all parts... the fast, uniform coverage and adjustable spray pattern.

All Binks gun parts are made of specially selected, wear-resistant materials. The air nozzle is of nickel-plated bronze; the material nozzle is made of hardened steel with self-centering needle. Cartridge-type air valves are employed in all three models. Because of such sound engineering and manufacturing know-how, Binks guns stand up under hard production use... that's extra economy for you.

"Binks is justly proud of its 'Big 3' production guns. They produce, at minimum cost, the high quality finishes demanded by the buying public."

J. H. Roche
Chairman of the Board

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Write now for free information on these guns.

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NEW YORK DETROIT LOS ANGELES ATLANTA BOSTON CLEVELAND
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KRANE KAR handles spare blooms for Blooming Mill, large slabs for Rolling Mill, charge boxes in Open Hearth, bars in Cold Drawn Bar Mill (finally loads them into railroad cars), changes rolls and bumper plates in Steel Strip Mill, and stands by to relieve heavy duty overhead cranes; transports all kinds of loads in Machine Shop, Construction and Maintenance Depts. With clamshell bucket, **KRANE KAR** moves sand in Welding and Foundry Depts., and coke in Coke Dept. *Ask for illustrated Bulletin 89—"How Metalworking Plants Reduce Materials Handling Costs."*

Gas or diesel, 12 to 37 ft. booms or adjustable telescopic booms; solid or pneumatic rubber tires. Buckets, magnets, and other accessories available.

THE ORIGINAL SWING BOOM MOBILE CRANE WITH FRONT-WHEEL DRIVE AND REAR-WHEEL STEER

1½, 2½, 5, AND 10 TON CAPACITIES

KRANE KAR

TRADE MARK REGISTERED

USERS: Carnegie-Illinois, U.S. Steel, Bethlehem, Youngstown S & T, Basic Magnesium, Lima Locomotive, General Motors, Pullman Standard, etc.

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Check with FAIRFIELD for FINE GEARS

Fine Gears

MADE TO ORDER:

SPIRAL BEVEL
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SPUR
WORMS AND WORM GEARS

MASS production of fine gears is an accomplishment that requires the ultimate in manufacturing facilities and experience. And it's all here at Fairfield—metallurgical departments, batteries of the most modern machines, complete heat treating equipment, all operated by skilled craftsmen producing truly fine gears. Here is 30 years of experience translated into the gear-making "know-how" that is essential to manufacturing high quality, dependable gears.

Our facilities are complete for producing gears for a wide variety of applications. Why not consult Fairfield on your next gear problem? Your inquiry will receive prompt attention.

FAIRFIELD MANUFACTURING CO.

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Chrysler Stamping Plant Designed for Press Mobility

Detroit — Immobility of giant presses is no longer a handicap of modern metal stamping plants.

In its new press plant at Nine Mile and Mound Roads just outside Detroit Chrysler has made a number of unusual provisions for the installation and moving of its giant presses.

Some earlier press designs had their operational parts mostly above floor level. Deep holes had to be dug sometimes to a depth of 20 ft to provide foundations.

The new Chrysler plant has an open basement. Large presses can be readily moved from one location to another. To move a press or add a new one at its Nine Mile plant, Chrysler has only to remove sections of the laminated timber flooring of the first floor.

The new presses are designed so that moving metal parts are below the level of the floor. Thus, operators fabricate the work above the floor while the basement offers a clear space where workmen can get at the operating mechanism of the presses quickly and easily.

The two largest machines in the plant weigh 440 tons each. Dies weighing 75 tons are employed. Presses exerting a pressure of 900 tons occupy a floor area 12 x 24 ft and stand 15 ft above the floor level and 18 ft below it.

Diesel Locomotives Set Record

Washington—Class I railroads placed more new locomotives in service in 1949 than in any similar period in 25 years, according to Assn. of American Railroads.

New locomotives installed in 1949 totaled 1865, of which 1808 were diesel and 57 were steam. In 1948, there were 1487 put in service, of which 1397 were diesel, 86 steam and 4 electric.

New freight cars put in service in 1949 totaled 84,669 compared with 102,737 installed in 1948. Class I railroads and railroad-owned and controlled private refrigerator lines, however, have put nearly 300,000 new freight cars in service during the past 4 years.

Dear Customer

by Jack R. Light

SOFT TOUCH—Perhaps the most relentless grind among THE IRON AGE editorial offices is that to be found in Washington. In point of fact it isn't an IRON AGE office at all, but is a three man news bureau serving all the Chilton Co. magazines, including this one.

The best regular representation we have of the efforts of the Washington office is in the Federal View (p. 48), which is a regular feature up in the front of the book. This is written by Gene Hardy, bureau chief, and at 28 the youngest burueau chief in the Washington Press corps. He is a veteran of 7 years in the office—came with us from the *Washington Post*.

In addition to the interpretative story carried in the Federal View, this office also maintains a steady flow of straight news copy for the New York news desk of IRON AGE. From its office in the National Press Bldg., the Washington bureau wades through 150 to 200 publicity handouts a day, looking for stories, or hints of stories that may be useful to us. Once the collection of free blurbs has been decimated, these reporters go out to follow up whatever leads they may have for the day.

Stories concerning the government departments frequently are written by Karl Rannells. He is a 5-year veteran in the Chilton bureau, specializes in features and likes to take a crack at a statistical story from time to time. A visit to the office may find him buried in official leaflets and pamphlets, laboriously compiling some significant information to make an exceptional feature story.

Leg man on Capitol Hill, and Congressional reporter extraordinary is George Baker. He was covering Congress for U. S. News and its affiliated Bureau of National Affairs before he joined the bureau. When Congress is in session he flies about madly from House to Senate, one committee session to another, a hearing here, and an interview there. George takes it on his shoulders to know the status of any legislation pertinent to the metals industry. Sometimes he misses, but if he doesn't know, he can find out in a few minutes.

With this three man operation feeding news into THE IRON AGE, not only do we seem to get complete coverage of what is going on in regular news circles, but from time to time these boys dish up an exclusive yarn. Those are the occasions when we are really proud of them—but they say sadly, only a fellow reporter knows a scoop when he sees one. To a reader, they pass unnoticed.

RECIPROCATING, CONTROLLED ATMOSPHERE FURNACES

SUITED TO WIDE RANGE OF GENERAL AND ATMOSPHERE WORK

VERSATILE. A.G.F. Reciprocating Furnaces are suited to continuous clean hardening, annealing, normalizing, case-hardening by the patented Ni-Carb process, etc. Work treated in the same furnace may range from extremely small light springs, stampings, drop forgings, etc., up to quite large and heavy pieces.

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200 Straight, S. W., Grand Rapids 4, Mich.

• *News of Industry* •

Bureau of Mines Reports On Recovery of Domestic Manganese

Recovery depends on further beneficiation and metallurgical savvy.

Washington—Upon the development of further beneficiation and metallurgical processes depends the maximum recovery of manganese from the extensive deposits in South Dakota's Missouri Valley, according to the Bureau of Mines.

Mining and beneficiation tests conducted by the Bureau are described in this final issue of a three-part report on South Dakota manganese-bearing shale.

Mining tests were conducted primarily to provide a suitable feed for various beneficiation processes. Much of the manganese is contained in concretions or nodules embedded in shale. These can be separated completely only if the shale is weathered. Selective mining of a thin layer off the top of the deposit was found impracticable, as was weathering the shale in windrows. Beneficiation tests showed that producing a shale-free concentrate involved heavy loss of manganese, especially as the shale itself proved richer in manganese than had been anticipated.

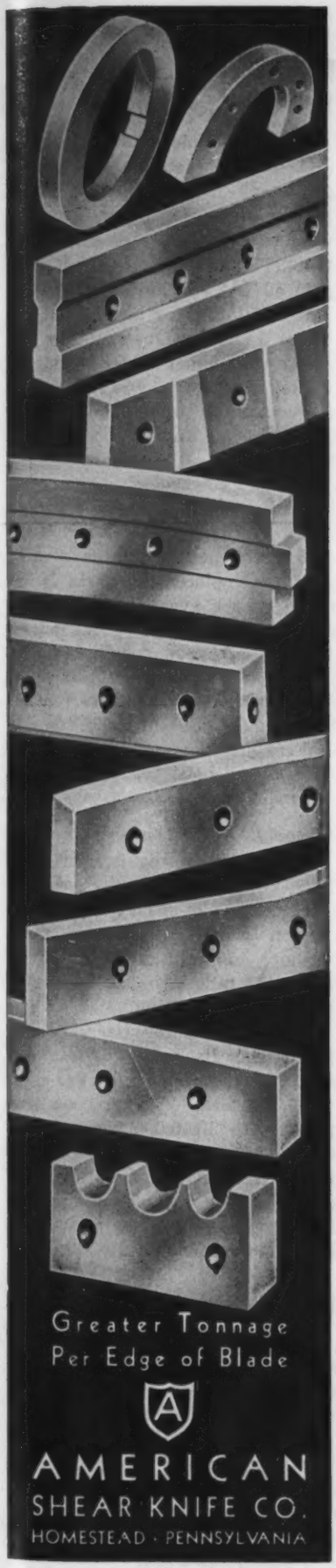
Testing Procedures Revised

Testing procedures were later revised, the report states. The entire deposit was mined. Various ore-dressing methods were tried, jigging yielding the highest recovery of manganese. However, the best concentrate produced by any method was relatively low grade.

Large-scale beneficiation of the material could aim at maximum recovery of shale-free concretions, at maximum recovery of manganese from the entire formation, or at some intermediate practice. Which goal should be sought, the report says, would depend upon the requirements of a market that does not yet exist.

The Missouri Valley deposits form the largest known reserve of manganese in this country, the report says.

A free copy of "Missouri Valley Manganese Deposits, South Dakota, Part III—Mining and Beneficiation Studies," is available.



Small Business Favored On Tie Bids for Government Work

Washington—Tie bids on government contracts will henceforth be decided in favor of small business.

This decision was announced by the Dept. of Defense and the General Services Administration, the two agencies that buy virtually all supplies—both military and non-military—needed by the federal government.

Where equal bids are received in a non-distressed employment area, and one is submitted by a small business concern, award will be made to the small business concern.

In the case of equal bids, two or more of which are submitted by small business concerns, award will be made by a drawing of lots limited to the small business concerns.

Enlarging Steel Warehouse

Chicago—Joseps T. Ryerson & Son, Inc., has begun construction of new, larger facilities in Cincinnati. The project includes a steel service and warehouse structure with a total of 165,000 sq ft of floor space, and a two-story office building. Total cost is expected to be more than $1 million. The new facilities are expected to be ready for occupancy in the fall, at which time the company will shift operations from its present Cincinnati location without interruption to steel deliveries.

Reduces Transmission Price

Detroit—The price of Packard's Ultramatic Drive automatic transmission has been reduced 18 pct. The new list price is $175 plus excise tax.

Production of the new automatic drive transmission has been placed on a two-shift basis at Detroit. It is expected that about 70 pct of all Packard cars produced in 1950 will be equipped with Ultramatic Drive, according to Karl M. Greiner, Packard vice-president and general sales manager.

* RECOMMENDATION

Spray buffed steel parts emulsion of Oakite Comp No. 97 in water. Rinse with fresh water at 140°

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Fisher Body Div. Uses 1000 lb of Steel Per Unit

Detroit—Some steel statistics of interest to the steelmaking industry have been released here. Fisher Body Div., for example, used 1,160,000 net tons of steel in 1949. This is enough steel, it is pointed out, to build 19 Empire State buildings or build 14 ocean liners like the Queen Mary. In area, the sheet steel used by Fisher Body is 1,500,000,000 sq ft—enough to provide a steel wall 26 ft high around the borders and the coastline of the country.

If the Fisher steel consumption is related to the 2,269,459 cars produced by General Motors—and the fact that some of this steel may be used for replacement parts is ignored — the average Fisher steel consumption per car works out to 1022 lb. A good rough figure to use for a Fisher body is 1000 lb of steel per unit. It should be remembered that in the GM setup, the several car divisions produce the front fenders and hood top for their individual cars.

Material Needs Impressive

Other Fisher requirements for 1949 are equally impressive: 51,000,000 sq ft of glass; 17 sq miles of unholstery; 9 million sq ft of leather; 150 million ft of copper wire; 169 million linear ft of rubber weatherstripping.

At the news auto writers' conference it was disclosed that total GM steel consumption in 1949 was 4,100,000 tons. This may be compared with 3,160,000 tons of steel used in 1948. This figure cannot be readily related to consumption per car because it includes an increasing quantity of steel being used by GM's non-automotive division.

Ford Sponsors Arts Program

Detroit—Ford Motor Co. will sponsor a national industrial arts awards program for junior and senior high school students.

Cash awards for outstanding workmanship and design will include wood work, metal work, mechanical drawing, printing, model making, plastics, machine shop and electrical work.

FATIGUE CRACKS

Continued from Page 20

mensions on large parts, which is where the pocket comparator is used, we doubt if we'd ever have any designs on triplets, since monogamy is still the rule of the land. We confess to being astigmatic, but we don't like the sound of *aplanatic* and aren't even going to look it up.

National Tool relents a little, though, when it explains that "heretofore it has always been necessary to use a different device for checking linear measurements, circles, angles, radii, etc. Now, at last there is one instrument that performs all of these inspection functions."

Then it starts talking about checking parts against graduated reticles, and we're in the dark again. Mrs. Flood, take a letter to National Tool Co., 11200 Madison Ave., Cleveland. Gentlemen: Where are you getting all these new words?

Aptronyms

With the passing of Dr. F. W. Splint, the aptronymists have lost the long-time acknowledged head of their medical division. Once this became known, Gulf Oil's C. G. zur Horst came up with the nomination of Dr. Russell W. Brain, London brain specialist (name fits the job, all right), to succeed to the post. Dr. Brain broke into the United States papers with the assertion that great authors are sometimes at least slightly off the beam. Sounds like an all-right guy, and we'll accept the nomination.

Puzzler

Both Fritz Fisher of the Wirebound Box Manufacturers Association and M. V. Dreyspool, who is protecting a 1.000 batting average, thought we might be serious about the dishonest bell boy who ran off with the $2.00 refund (Jan. 19) and drew us a picture of what happened. And W. R. Felts, General Electric, Richland, Wash., finally got around to figuring out that the camper in the Dec. 22 issue had pegged his tent on the north pole.

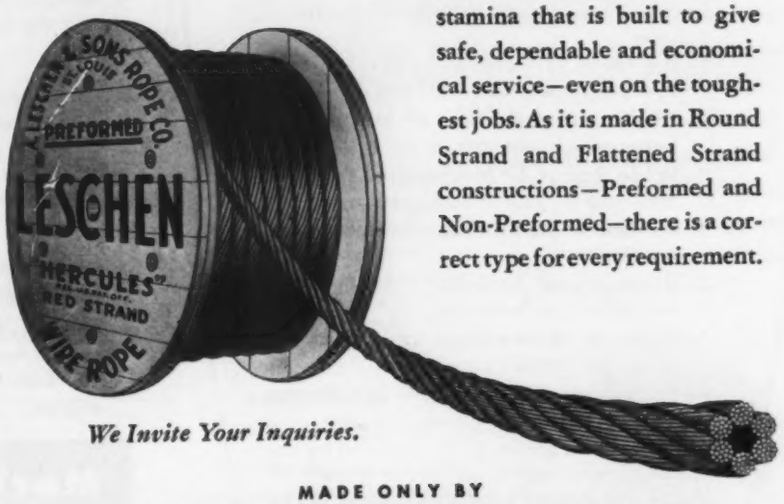
It's not time for answers to roll in yet on last week's toughie about the barrel with three spigots, but the first reader who tells us how to arrive at the posted answer of 6/11 hr, or proves it wrong, gets a free copy of your f.f.j.'s "Directory of 10,000 Trade Names."

This week we shall consider the question raised by J. H. Schloen, metallurgist, Canadian Copper Refiners, Ltd., Montreal: Using a balance, what four weights are required to enable you to weigh from 1 to 40 lb, pound by pound?

Resume Your Reading on Page 21

You Can Depend on

"HERCULES" (RED-STRAND) WIRE ROPE



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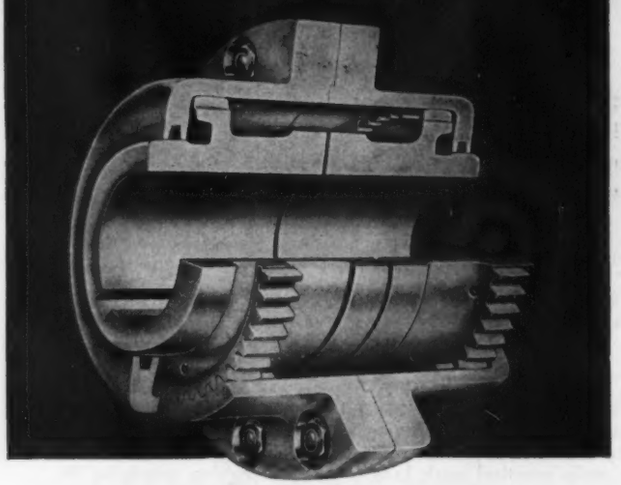

A COPY OF CATALOG GIVING FULL DESCRIPTION AND ENGINEERING DATA SENT UPON REQUEST.

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5/16"x1/4"	1/2"x3/16"	1/2"x9/32"	11/32"x7/32"	11/32"	1/4"
5/16"x3/16"	1/2"x5/32"	1/2"x7/32"	5/16"x1/4"	21/64"	7/32"
1/4"x3/16"	13/32"x9/32"	1/2"x3/16"	5/16"x9/64"	5/16"	3/16"
1/8"x3/8"		1/2"x5/32"	9/32"x7/32"	9/32"	5/32"
		7/16"x13/64"	7/32"x5/32"		9/64"
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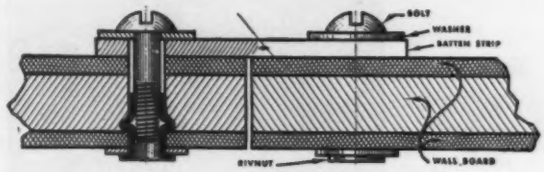
NEW ¼" STEEL RIVNUT

improves building design... speeds construction... cuts costs!



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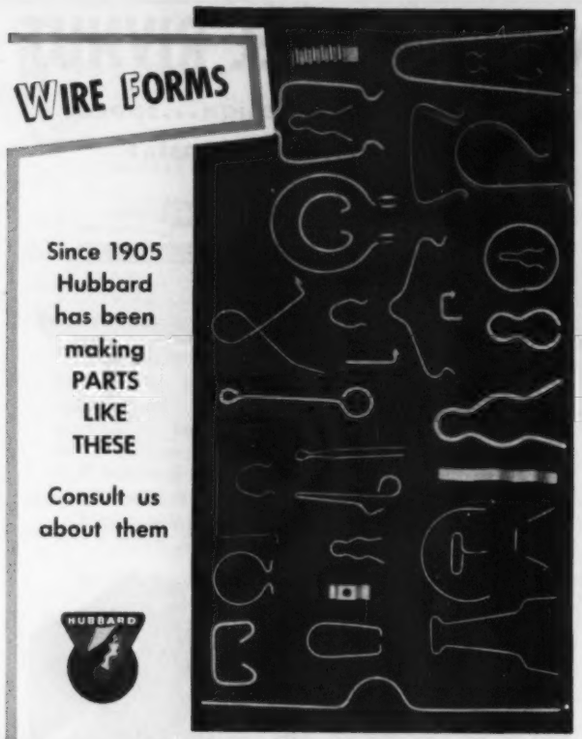
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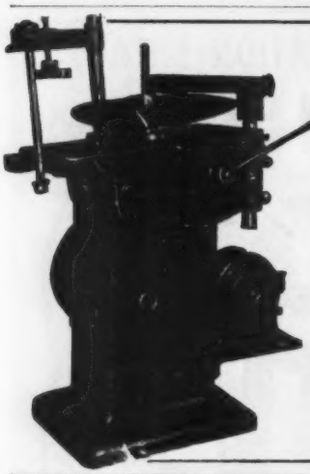
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IRON AGE INTRODUCES

Continued

O. D. H. Bentley has become associated with the WHITON MACHINE CO., New London, Conn., as a consulting engineer on steam turbines. **Eugene B. Williams** joined the same firm to take charge of the sale of Whiton Steam Turbines for U. S. Navy applications. Mr. Bentley was for many years chief engineer of the B. F. Sturtevant Co. of Boston, while Mr. Williams served as vice president in charge of sales for the same company.

OBITUARIES

Albert F. Paustian, chairman of the board of Brillon Iron Works, Inc., Green Bay, Wis., died on Jan. 1. He was 83.

Josiah E. Spurr, 80, geologist and authority on mining, died Jan. 12 in Winter Park, Fla.

Dr. Ernest W. Westcott, 61, who served as technical adviser to Gen. Leslie R. Groves in developing the atomic bomb and vice president of Comstock and Westcott, research engineering firm in Cambridge, Mass., died on Jan. 14.

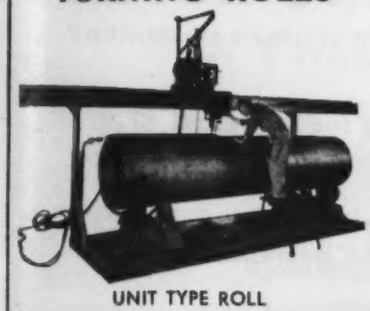
John G. Allan, 75, noted metallurgist and retired president of Norfolk Harding Works, Dorchester, Mass., died Jan. 15.

Wilmer C. Swartley, 69, a partner in the Philadelphia Steel & Iron Co., Conshohocken, Pa., died on Jan. 23.

L. K. (Jack) Simons, 54, vice president and manager of the R. D. Bracken Co., Sanford, N. C., died on Jan. 11.

Resume Your Reading on Page 23

TURNING ROLLS



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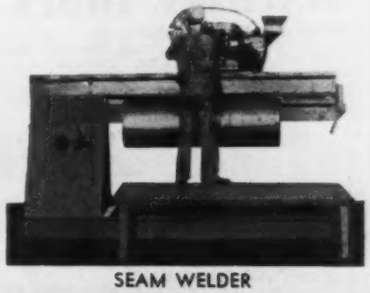

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COLBURN 72", 2 swivel heads, Rapid Traverse, M.D.
KING 62", 2 swivel heads, Rapid Traverse, M.D.
NILES 106", 2 swivel heads, PRT, D.C., Motor Dr.

DRILLS—Miscellaneous
AMERICAN 4' arm 11" col., "Hole Wizard", Latest
[illegible]AND & GIFFORD #2 LMS 6 spindle, Latest
NATCO 2 AL 30 spindle, Multiple, Latest Type

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GLEASON 24", 77", 96", Bevel Gear Planer, Motor Dr.
GOULD & EBERHARDT 96H, Hobber, with Differential, Motor Drive

GRINDERS—Cyl.—Plain & Univ.
BROWN & SHARPE #1, 2, 3, 4, Universal, Latest
BROWN & SHARPE #13 Univ. Cutter & Tool, Latest
LANDIS 4x12, Type H, Plain Hyd., Latest Type
NORTON 6"x18", 6"x30", 10"x36", 10"x72" 14"x36", Type Q Plain, Latest Type

GRINDERS—Miscellaneous
BABBER COLMAN #3, 4 hob sharpener, latest type
CINCINNATI #2, Centerless "Filmatic," latest type
HEALD 75A, 72A3, 72A5, 74, Internal, latest type
LANDIS #12 Centerless, Hydraulic, Latest Type

GRINDERS—Surface
BLANCHARD #11, 16" Mag. chuck, Latest Type
GALLMEYER & LIVINGSTON, No. 45, Hydraulic 12"x24", Latest type
HANCHETT Series 300, 12"x48" Vert. Sp. Hy., latest
HANCHETT #36 Vert. 36" Mag. Chuck, Latest
HANCHETT Series 120 Piano Horiz., 30"x120", latest
HEALD 25A—Rotary—16" and 30" chuck, hyd., latest
THOMPSON 12x12x24 Type B Hyd., Latest Type

LATHES—Engine & Mfg.
AMERICAN 36"x360" centers, 2 carriages, motor dr.
LODGE & SHIPLEY 14"x30", 16"x30" Centers, latest
MONARCH 10"x20" centers, Model EE Timken, latest
MONARCH 12"x30" Centers, 12x54" Centers, Model CK, Timken Bearing, Latest Type
MONARCH 22"x450" centers, 3 carriages, Timken Bearing, Model CM, motor drive
NILES 30x50" Boring, Timken, Latest Type
NILES 60"x55' centers, 2 carr., PRT, Latest Type
PRATT & WHITNEY 16"x30" Centers, Latest Type

LATHES—Turret
BARDONS & OLIVER #5, #7, Timken, Latest Type
FOSTER #4FU "Fastermatic", Timken, Latest
GISHOLT #1L, #2L, #3L, Universal, Timken, Latest
GISHOLT #3, #4, Univ., TIMKEN, Latest Type
JONES & LAMSON #3, #5 Univ., Timken, Latest
MOREY No. 2G, No. 3, No. 4, Timken Bearing, latest
WARNER & SWASEY #2A, 3A, Univ., Timken, Latest

MILLING MACHINES—Plain
BROWN & SHARPE 2B, 3B, Timken, Latest Type
CINCINNATI 4-36, 2-18 Hydromatic, Simplex, latest
KEARNEY & TRECKER 1218, 1404, Latest type
KEARNEY & TRECKER 2H, 3H, 4H, 5H, 4K, Timken Bearing, Latest Type

MILLING MACHINES—Thread
LEES-BRADNER Mod. HT 12"x54", Mod. LT 6"x36", Latest type
MOREY 12"x30" and 60" centers, Latest Type

MILLING MACHINES—Universal
BROWN & SHARPE 2A, 3A, Timken, Latest Type
KEARNEY & TRECKER 2H, Timken, Latest Type
VAN NORMAN #26, #36, Timken, Latest Type

MILLING MACHINES—Vertical
BROWN & SHARPE #2B, Timken, Latest Type
CINCINNATI #2, #4 Dial Type, Timken, latest type
GORTON #8D, #8½D, high speed, latest type
KEARNEY & TRECKER #2H, #2K, #3H, Timken

PLANERS
BETTS (CONSOLIDATED) 84"x92"x16', 4 heads, Box Table, Power Rapid Traverse, D.C., M.D.
BETTS (CONSOLIDATED) 108"x84"x50', 4 heads, Box Table, Power Rapid Traverse, D.C., M.D.
NILES "Time Saver," 42"x42"x14', 3 heads, Rapid Traverse, A.C. vari-voltage drive, Latest
NILES 108"x84"x42', 4 heads, Power Rapid Traverse, Box Table, D.C. reversing motor drive
NILES-BEMENT-POND 96"x96"x24', 4 hds., M.D.

SCREW MACHINES—Automatic & Chucking
GOSS & DeLEEUW 6"x6¾" Auto. Chucker, Latest
GOSS & DeLEEUW 8" Auto. Chucker, 5 spin., Latest

MISCELLANEOUS
BARNES #172, 306H, 307, 307B Vertical Hone, Hydraulic, Self-Oiling, Latest Type
CINCINNATI 1-30, 3-30, Duplex Vert. Surface Broach, Double ram, Model ER Hyd., Latest Type
HENRY & WRIGHT 50 ton Dieing Press, M.D.
MICHIGAN 1708, 1712 Universal Reliever, Latest
PRATT & WHITNEY "KELLER" Model BL-2416 3 dimensional, Latest
SWISS #4 Precision Jig Borer, M.D.

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THE CLEARING HOUSE

NEWS OF USED, REBUILT AND SURPLUS MACHINERY

First inspection period for screened sale changed to week-end of Feb. 4

Strong market in Detroit hinges on current strike possibilities

Pertinent topics to be covered at MDNA director's meeting, Friday, Jan. 27

Inspection Dates Changed For Screened Sale in Secret Plant

Newark, N. J.—The first inspection period of the unusual "private" machinery sale previously announced has been changed to the weekend starting Saturday, Feb. 4. This sale, classified as strictly "a private sale by invitation only," is being conducted by Asset Realization Co., Newark, N. J. The machines being sold are presently installed in a plant that is doing highly secret Government work.

Prospective buyers, or their representatives, are being screened carefully before being permitted into the plant. The name and location of the plant, for security reasons, are not being publicized, but as prospective buyers are approved for entry into the plant they are informed of the location. Persons wanting to inspect the machines fill out application forms in triplicate and forward them to the Asset Realization Co. Approved United States citizens receive registration cards permitting entrance to the plants over specified week-ends.

The present schedule calls for the first inspection period on Saturday and Sunday, Feb. 4 and 5, and a second period Feb. 11 and 12. Although inspection periods have been arranged for week-ends, most machines may be inspected in operation. Items such as heat treating furnaces, tool room machinery, production machinery, air compressors and others are among the several hundred major items offered for sale.

Detroit Market Appears Strong; But Strikes May Change Outlook

Detroit—While there has been a noticeable pick-up in many segments of the local rebuilt machinery market since the turn of the year, there is some hesitation here about the underlying strength of the market. The possibility that a coal strike may act as a deterrent on local buying has not been overlooked. It is also agreed that a strike at Chrysler would have a definitely deflating effect on buying. Perhaps an even larger deflationary factor in the present situation concerns the failure of plant managers to obtain necessary appropriations with which to carry out their modernization plans.

As one supplier here observed: "The mechanical departments are definitely interested in cost cutting, and in rebuilt equipment to do that job. At the moment, however, we are a little hesitant about saying that the appropriations will be provided to back up many of the plans now on the drawing boards."

Most of the interest here is in production type equipment. The demand has focused on hydraulic presses, milling machines, forging machines and other production items. While there has been some interest by small local and out-of-town firms, the bulk of the pro-

Turn to Page 184

MDNA CHAPTER MEETINGS

CHAPTER	DATE	TIME	PLACE
Chicago	Thurs. Feb. 16	6:30 p.m.	Streamliner
New York	Mon. Feb. 27	6:30 p.m.	Cavanagh's
Philadelphia	Tues. Feb. 28	6:30 p.m.	Warwick

A Voluntary Piece-By-Piece Sale At

PUBLIC AUCTION!

TUESDAY
WEDNESDAY
THURSDAY
FEBRUARY 14-15-16
STARTING AT 11 A.M. EACH DAY

$1,500,000.00
TOOL & DIE PLANT
of the **PEERLESS TOOL & ENGINEERING CO.**
1133 N. KILBOURN AVE.
CHICAGO, ILLINOIS

No Confirmation Required! Immediate Delivery!

TOP QUALITY - MODERN

PRECISION MACHINE TOOLS, TOOL ROOM & PRODUCTION EQUIPMENT

and the manufactured products, inventory & manufacturing rights

Consisting of:

6—JIG BORERS: 4 Fosdick Model 30; Moore Precision; Sip (Swiss) Precision JIG GRINDER: Moore Precision, Serial No. 117, 16" x 10" Table
8—KEARNEY & TRECKER 4H DIAL TYPE HORIZONTAL MILLS
8—KEARNEY & TRECKER 4H DIAL TYPE VERTICAL MILLS
2—DIE SINKERS: Reed-Prentice No. 5 and Reed-Prentice No. 3VG
9—TOOL ROOM LATHES: 2 Monarch Model BB; 2 Monarch Model C; 2 Monarch Model EE; Lodge & Shipley 20" x 48"; Reed-Prentice 20" x 54"
16—PRECISION BENCH LATHES: 5 Hardinge T.R.-50; 3 Rivett No. 918; 3 South Bend 9" x 3'; 2 South Bend 10" x 42"; 2 Hardinge Cataract; and Elgin 6" x 24"
9—VERTICAL TURRET LATHES & BORING MILLS: Bullard 54"; 5 Bullard 36" and Rogers 30" Lathes; 2 Bullard 42" Mills
DEFIANCE No. 25C, 4" HORIZONTAL BORING BAR
BARNES HYDRAULIC DOUBLE END HORIZONTAL DRILL
HEALD NO. 46B, "BOREMATIC" PRECISION BORER
8—TURRET LATHES: Warner-Swasey 4A Universal; J & L No. 9A Universal; 3 Warner-Swasey No. 4 Universal; Mercy 2G and 2 Logan 840.
4—RADIAL DRILLS: Droses 6' x 15"; Mueller 4' x 11"; Cincinnati 3½' x 9". and Walker-Turner Model R.D.
32—DRILL PRESSES: Leland-Gifford, Fosdick, Foote-Burt, Cincinnati, Baker, Prentice, Multiple and Single Spindle, Sensitive and Heavy Duty. Aurora and Henry & Wright Uprights up to 30". Delta, Peerless, Atlas and Buffalo 14" Upright and Bench Type.
21—SURFACE GRINDERS: Mattison 14" x 60"; Blanchard No. 18 Rotary; Norton 10" x 36"; Heald 25A; 4 Norton 6" x 18"; 2 Taft-Pierce No. 1; and 11 Reed 6" x 18"
6—CYLINDRICAL GRINDERS: B & S No. 3; B & S No. 2; B & S No. 1; Heald 72A-5, Landis Type C and B & S No. 10.
7—TOOL & CUTTER GRINDERS: 2 Cincinnati No. 2; Ingersoll; Sellers No. 80; Excello Type C; Cincinnati Model 102 and Rotorex 101-A.
4—UNIVERSAL MILLS: Van Norman 22L; B & S No. 2; B & S No. 2A and Kempsmith No. 3
6—HORIZONTAL MILLS: K & T No. 4; B & S No. 3B; B & S No. 3; B & S No. 2B; Bilton Model 25 and Burke 126A.
7—NATCO DRILLS: No. 1½ Heavy Duty; No. B-3A 6 Spindle; B-3A 4 Spindle; B-2A 2 Spindle and No. 1½ 2 Spindle.
5—PUNCH PRESSES: Bliss 5A; Verson 1A; Ferracute No. 5; Industrial Model A and Walsh No. 5.
5—SHAPERS: Milwaukee 20"; 16" and 12"; Averbeck 17" and G & E 16"
8—METAL SAWS & DIE FILERS: Grob NS-18 and Model S-14; Wells 8M-42 Band Saws; Racine 18" Hack Saw; Grob FA-18 and Thiel No. 3 Die Filers.
9—SUN AVIATION PARTS GRINDERS: Internal, External & Contour.
ALSO A LARGE QUANTITY OF PRECISION INSTRUMENTS & INSPECTION TOOLS; PERISHABLE TOOLS & TOOL CRIB SUPPLIES; MODERN OFFICE EQUIPMENT & BUSINESS MACHINES; BUICK 1948 ESTATE WAGON AND STUDEBAKER 1949 STAKE TRUCK.

INSPECTION: 9 A.M. TO 4 P.M. DAILY (EXCEPT SUNDAY)
BEGINNING WEDNESDAY, FEBRUARY 8TH TO DATE OF SALE

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FIRST NATIONAL BANK BLDG. CHICAGO 3, ILLINOIS

AIR COMPRESSOR

1000 Cu. Ft. Worthington "Feather Valve," 18" x 11" x 14" two stage with 185 HP synchronous motor on shaft.

AUTOMATIC

4⅜" Conomatic 4 spindle, serial No. 2191K with, reel, chip conveyor, extra equipment.

BORING MILLS

4½ bar Lucas No. 33. Table 46" x 64", Max. height 36", Max. to outboard support 11'.

100" Niles Bement Pond. Extra heavy type. 2 swivel heads, power rapid traverse, 35 HP direct current motor.

BROACH

15 ton 36" stroke American vertical duplex surface with tilting type workholder.

DRILL

42 spindle, No. B16 Natco multiple with 18" x 48" drilling area and two box tables.

GEAR HOBBER

Type T Barber Colman. Designed for either straight or taper splines, helical or spur gears. Also type A and Nos. 3 & 12 Barber Colmans.

GRINDERS

6" x 18", No. 10 Brown & Sharpe "Electric Hydraulic" Three with and two without spindle oscillation. New 1940 and 1941.

10" x 36" Norton type C hydraulic with hydraulic quick in-feed. Serial No. C16458, new in 1942.

10" x 72" Norton type C hydraulic made at factory to swing 14". Serial No. 21750, new in 1944.

23" x 36" Norton type C with mechanical table traverse, hydraulic quick in-feed. Serial No. C18281, new 1943.

LATHE TURRET

No. 2FU Foster Fastermatic Serial No. 2FU529, new in 1944. Quite a little tooling.

MILLERS

Cincinnati Hydromatic Sizes: 3-24, 34-36, 4-36, 4-48, 5-48, 56-72 and 56-90.

PRESSES

1000 ton, No. 666 Toledo knuckle joint Coining. 2½" stroke, 18" shut height, bed 37" F to B x 31" R to L.

350 ton Clearing Crankless, model F1350-42, serial No. 45-11155P, new 1945. 20" stroke, 28" shut height, 36" x 42" bed.

600 ton Hamilton No. 2316½ eccentric shaft forging. Stroke 4"; shut height 16", bed 28" F to B x 23¾" R to L.

No. 506 Bliss on inclined legs with double roll feed and scrap cutter. About 126 tons. 3" stroke, 11½" shut height.

1000 ton Baldwin Southwark "Hy-Speed" hydraulic. 20" stroke, 56" daylight, bed 42" F to B x 54" R to L.

UPSETTERS

2" National. Serial No. 13213. Has suspended slides with long overarm guide. Has 15 HP motor.

4" Ajax. Serial No. 3156. Has twin drive gears, suspended slides, self contained backshaft, 30 HP motor.

MILES MACHINERY CO.
SAGINAW, MICH.

Continued from Page 180

jected volume has originated with the larger metalworking plants.

Local buyers will be particularly interested in the prices to be paid for a substantial amount of equipment that will be sold at auction at the Pryde Tool & Die Co., Detroit on Jan. 31. In the past such auctions have often reflected the market strength of equipment high in demand.

Fox Addresses Chicago MDNA

Chicago—J. M. P. Fox, executive director of the Machinery Dealers National Assn., was principal speaker at the Jan. 19 meeting of the Chicago chapter held at the Steak House and attended by 30 dealer's representatives. Mr. Fox reported on the association's plans for increasing national membership. After this report, Elliot Blumberg of Adams Machinery Co. and other speakers led a discussion of past activities of the organizaton and the resultant benefits to member dealers. The next local meeting has been tentatively set for Thursday, Feb. 16, at the Streamliner Cafe.

MDNA Director's Meeting Set

Chicago—The director's meeting of the Machinery Dealers National Assn. will be held at the La Salle Hotel in this city on Friday, Jan. 27. Among the more pertinent topics of discussion will be plans for the national convention, MDNA standards and ethics, a committee report on the price and serial number book, and plans for the machine tool conference to be held at the Wharton School of Finance, University of Pennsylvania.

NISA Plans Biggest Meeting

Cincinnati—The biggest regional meeting ever held by the National Industrial Service Assn. is scheduled by the seventh region for Feb. 10 and 11 in Cincinnati. The meeting committee, F. W. Willey, S. F. High, and J. H. Hennequin, is planning for an attendance in excess of 200 dealers. Members and all eligible prospects in Ohio, West Virginia, and Kentucky are invited to attend.

Resume Your Reading on Page 181

FOR SALE

2 EXTREMELY LARGE ALL STEEL FORGING PRESSES

#6 *NATIONAL Vertical All Steel Maxi Press*

Stroke 8"
Bed area 52" FB x 40" RL
Slide area 42" FB x 34" RL
Die space 29"
Diameter of crankshaft at bearings 17½"
Strokes per min. 25
Direct motor, connected drive with motor and starter
Weight approx. 225,000 lbs.

#35 *CLEVELAND Heavy Duty Forging Press*

Stroke 12"
Strokes per min. 30
Die space 29"
Diameter of crankshaft at bearings 17½"
Slide area 60" FB x 34" RL
Bed area 66" FB x 40" RL
Double geared, twin geared drive
Width between upright 44"
Direct motor, connected drive with motor and starter
Weight approx. 315,000 lbs.

BOTH MACHINES ARE IN EXCELLENT CONDITION

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NILES "TIMESAVER"

30" x 19' LATHE

New in 1941. Actual swing over ways 34½"; distance between centers 12'; all Timken bearings in head and quick change gear box; 12 geared spindle speeds; power rapid traverse; AC 3/60/220/440 motor and controls

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